

Chapter 4

Maintenance Management

Chapter 4 describes maintenance management procedures for various types of maintenance operations.

SECTION I - PROCESS AND RESOURCES

4-1. Broad principles of maintenance that provide the framework for operating a maintenance shop are found in AR 750-1. Those that apply to maintenance support follow:

- Commanders are responsible for establishing a command climate that ensures all assigned equipment is maintained according to appropriate technical manuals and AR 750-1.
- Commanders are responsible for providing resources, assigning responsibility, and training their soldiers to achieve the desired standard.
- The MAC is the primary tool used to determine the degree of maintenance and to specify the tasks to be performed at each level.
- The decision to repair or evacuate is based on the maintenance recovery code (MRC) and the recovery code (RC), the urgency of need, and METT-TC.
- Unserviceable reparable beyond the MAC's authorization to repair must be evacuated promptly to the appropriate maintenance activity for repair.



PROCESS

4-2. The maintenance management process includes—

- Forecasting.
- Scheduling.
- Production control.
- Quality assurance.
- Technical assistance.
- Provisioning of repair parts.
- Workloading/cross-leveling regional workload.
- Developing reparable programs to meet local, regional, and national needs.

4-3. Inherent in the maintenance management responsibility is the obligation to provide a safe environment while conducting maintenance operations. Maintenance management is as important during field or combat operations as it is for garrison maintenance missions. Safety concerns must be addressed in the SOP and operations orders.

4-4. Maintenance management policies and procedures are contained in the Maintenance Management UPDATE, which includes AR 750-1 and DA Pamphlets 738-750 and 750-35. Divisional and nondivisional units utilize the SAMS to collect maintenance data and provide management information to each level of command. Repair parts management policies and procedures for both using unit and DS maintenance units are found in the Unit Supply UPDATE.

SUSTAINMENT MAINTENANCE

4-5. Sustainment maintenance structures and operations are based on requirements generated by ASCC and TAACOM. Sustainment maintenance leadership will—

- Provide sustainment functional training to TAACOM maintenance/supply directorates and area support groups.
- Assist ASCC/TAACOM managers concerning sustainment maintenance issues to optimize capabilities.
- Assist in planning and updating theater-focused maintenance support plans to capitalize on fixed-base and mobile maintenance capabilities, including review of RC GS-level maintenance MOS proficiencies to support assigned missions.

4-6. The sustainment information management systems will—

- Include connectivity with current maintenance and supply STAMIS (SAMS/SARSS/ABF, etc).
- Recommend preassigned maintenance support RIC instruction to TMMC/CMMC for in-theater and strategic base (CONUS/OCONUS) ISM operations.
- Monitor worldwide component availability for items identified as ASCC/TAACOM core weapon systems and critical equipment components (Classes VII and IX).

- Maintain visibility over repair part availability, identifying potential line-stopper parts for critical items that support the repair of components of major and secondary items.
- Assist in maintenance retrograde and redeployment phases of the operation.

Figure 4-1 lays out the sustainment maintenance support structure from the sustainment base to the corps rear.

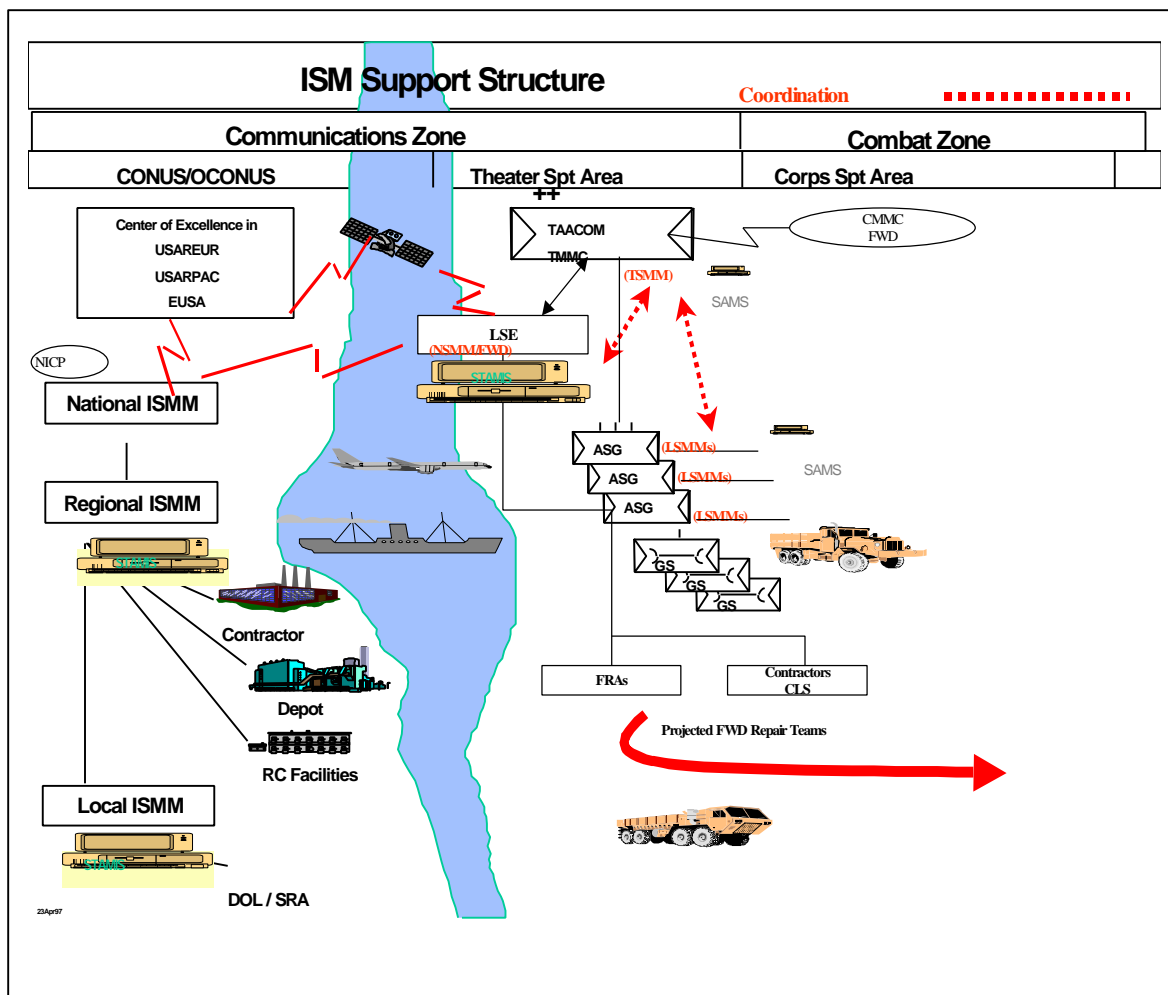


Figure 4-1. Layout of Sustainment Maintenance Support Structure

READINESS AND SUSTAINMENT MAINTENANCE MANAGERS

4-7. The various management functions required resulted in classification of maintenance management into two echelons—readiness and sustainment. Commanders are responsible for equipment readiness. Readiness maintenance managers at corps and lower echelons support commanders by managing operations to enhance equipment readiness. Readiness maintenance managers maximize

combat readiness by coordinating repairs as far forward as possible for quick return to battle. Readiness maintenance managers assigned to support battalions support brigade-size units.

4-8. Sustainment maintenance managers integrate sustainment maintenance (minus medical) for the total Army. They recommend support structure to the CINC and implement policies and procedures that provide optimal sustainment maintenance support to the full spectrum of total Army missions. This is a seamless process transparent to the user. They participate in development and integration of the LSE.

National Sustainment Maintenance Manager

4-9. The NSMM—

- Serves as principal agent for developing, coordinating, and integrating the sustainment maintenance (SM) relations portions of contingency SASO plans.
- Provides a sustainment maintenance support structure as part of the LSE to support the theater.
- Provides oversight of total Army SM capabilities and capacities.
- Recommends changes in infrastructure, facility upgrades, realignments, and modernization; recommends consolidation of SM capability to maximize efficiency.
- Rounds out RC GS maintenance unit (GSMU) technical training requirements with existing resources; assists in development of training plans to enhance SM skills.
- Develops, integrates, and standardizes SM procedures, policies, and operations.
- Coordinates and provides input to materiel developers and commodity managers in the integrated logistics support (ILS) process as it relates to SM support resources.
- Works with combat developers to revise input to materiel developers in identifying special tools and TMDE requirements for new weapon systems.
- Works with combat developers in articulating SM aspects and requirements for standard and emerging logistics management information system integration, including financial system interface.
- Provides recommendation to regional and national level agencies on how best to achieve SM objectives by consolidating regional and national requirements.
- Identifies nonexecutable SM requirements and recommends resolution.
- Monitors and tracks SM cost, production, and performance data; recommends improvements on day-to-day and future operations.
- Assists regional and national agencies in resolving line stoppers, non-mission-capable equipment, and quality deficiency reports.
- Monitors and realigns/balances regional workload by cross leveling between regional and national agencies.

- Provides continuity mechanism for backfill of regional and local management functions during mobilization, contingencies, deployments, and SASO situations.

Regional Sustainment Maintenance Manager

4-10. The RSMM, located at a designated geographical area, has the authority to prioritize and redirect workload among the LSMMs. Depending on the extent of support required, an RSMM operation may be established in an overseas theater of operation as part of LSE support. The RSMM—

- Tailors reparable programs submitted by LSMMs to meet regional demands and training requirements, weapon system availability, and cost avoidance.
- Determines regional normal and surge capability and capacity.
- Determines COE selections.
- Receives national-level requirements, performs capacity and capability assessments, bids on national workload, and submits program status reports.
- Performs cost analysis assessments.
- Identifies work that cannot be accomplished within the region and elevates it to the national sustainment maintenance manager.
- Plans for sustainment maintenance support for mobilization and deployments.
- Interfaces with LSMMs, the NSMM, field commanders, and staff.

Local Sustainment Maintenance Manager

4-11. The LSMM workloads all sustainment maintenance units and activities in a designated geographic area, which could be at multiple maintenance centers. There may be situations where an LSMM operation is established in an overseas theater of operation as part of LSE support. The LSMM—

- Develops reparable programs to meet local demands.
- Conducts work center capability and capacity assessments.
- Prepares bids and competes for COE selection for the region as well as for national work.
- Performs exception management.
- Identifies work that cannot be accomplished within the local geographical region and elevates it to the RSMM.
- Conducts cost analysis.
- Interfaces with customers, other LSMMs, and the RSMM.
- Plans for mobilization, deployments, and SASO.
- Plans for capacity and capability modernization.

4-12. Sustainment maintenance managers at corps and above focus on materiel management. They focus on fixing by repair, sustaining units, and supporting joint/multinational equipment and standard Army systems. Sustainment maintenance managers are assigned to theater and DA support commands. Managers use their maintenance knowledge and experience, along with aid from their management interfaces and CSS computers, to determine potential and developing problems and to

facilitate avoidance or resolution. Figure 4-2 illustrates how sustainment managers interface.

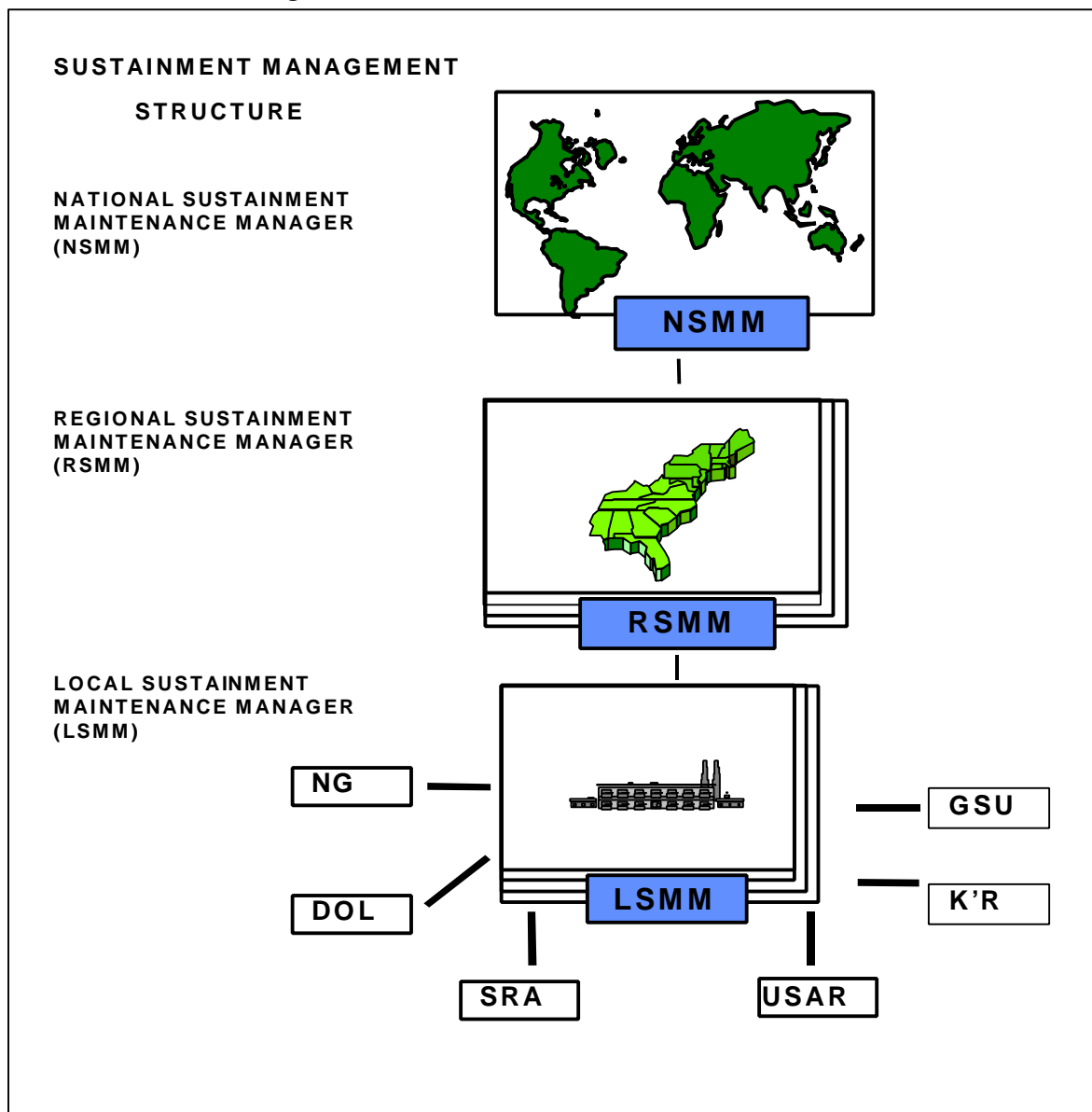


Figure 4-2. Sustainment Managers Interface

MATERIEL MANAGEMENT CENTER

4-13. The MMC is the maintenance manager for deployed Army forces. It is the link between the deployed forces and the support base. The MMC maintains a close working relationship with the LSE. Theater-level GS maintenance companies may come under the LSE for workloading. Also, the MMC may support equipment of other services or multinational forces.

RESOURCES

4-14. Resources are the tangible and intangible assets needed to accomplish the mission. They include—

- People.
- Tools.
- Test equipment.
- Repair parts.
- Publications.
- Facilities.
- Time.
- Skills.
- Funds.

Maintenance managers' objectives are to maintain readiness at the optimal level with the least expenditure of resources. Managers must decide what resources are needed to support specific mission requirements and advise the commander on the logistic impact of various courses of action.

4-15. Maintenance management deals with various factors affecting a unit's mission:

- Command emphasis.
- Day-to-day management skills.
- Supervision.
- Motivation.
- Technical skills.

Managers use these tools to channel maintenance efforts. Failure to achieve wanted results often stems from failure in one or more of these areas.

COMMAND EMPHASIS

4-16. The commander sets the tone for what is important within the command. The personal example of leaders shows their concern for specific aspects of the unit's mission. This concern is translated into action by the soldiers in the command. To place command emphasis on maintenance operations, the commander shows an active interest in these operations and in the materiel readiness of unit equipment. Maintenance managers use command emphasis to influence the support mission even though they may not be in the chain of command. Commanders need to balance mission, training, and administrative requirements to form a cohesive unit.

MANAGEMENT SKILLS

4-17. Maintenance managers strive continuously to improve their operations. Since the management process itself plays a key role in maintenance operations, managers should always look for ways to improve planning, organizing, coordinating, directing, and controlling. Managers must also look for ways to be proactive (influencing events

before they happen) rather than reactive (reacting to events as they happen). Feedback and after-action reports are also vital tools used by maintenance managers.

4-18. Under the stress of day-to-day operations, these elements may lose visibility and may not seem to have a direct bearing on materiel readiness. However, small improvements in the total system bring greater overall benefits than a heroic effort directed toward one or two items. The maintenance manager must be extremely careful that changes to maintenance operations do not undermine other initiatives established by the commander.

SUPERVISION

4-19. First-line supervisors are a vital link in the chain of command. The commander depends on them to accomplish the day-to-day mission and to ensure the welfare of the troops. First-line supervisors receive instructions and turn them into tangible results. Passing along the commander's requirements is only a small part of their responsibilities. Their major challenge lies in ensuring that the people they supervise accomplish the mission. First-line supervisors are the individual soldier's primary source of assistance and further professional development. They need to know the standards and objectives set by the chain of command in order to direct their soldiers' efforts.

4-20. First-line supervisors must be aware of mission requirements and the capabilities and limitations of the soldiers under their control. They must continuously train their subordinates to support the needs of the battlefield. Next to the mission, the welfare of soldiers and their professional development are paramount in the supervisor's mind.

MOTIVATION

4-21. Motivation is the need instilled in an individual to perform designated tasks. The leadership demonstrated by commanders and supervisors greatly influences motivation of soldiers. Effective leadership is the key to motivation. Effective leaders define objectives, communicate them, evaluate how well they are achieved, and provide feedback to soldiers doing the work. Maintenance managers often underestimate the importance of this process. Most soldiers want to perform well, but they must know the objectives and standards and receive performance feedback. Superior achievement must be recognized and substandard performance must be corrected.

TECHNICAL SKILLS

4-22. Technical skills are the ability to perform tasks associated with duty positions. Training provides these skills. A soldier's skills are one of the commander's most important assets. When the battle begins, there will be little time for training. The commander must always strive for high levels of training. The Army training system depends on the unit commander's continuing the training process begun during advanced individual training. Many training resources are available. The commander and the maintenance manager must use these resources to

maximum advantage. To a maintenance company commander, training on technical tasks is as important as training on tactical skills. Mission training plans (MTPs) and soldier training publications establish the requirements for technical maintenance training.

SECTION II - LEVELS OF MANAGEMENT

4-23. Section II discusses maintenance management roles at the various levels. Maintenance operations must have careful direction, supervision, and management. These functions are accomplished at the company and higher headquarters levels. The higher headquarters elements concerned with maintenance operations are the MMC for the command and the support operations office for the battalion. The chain of command and other supporting units provide technical assistance on request. Close coordination with the MMC and the battalion's support operations office is essential. The MMC and the battalions must work together and have a thorough understanding of the capabilities and limitations of each.

4-24. Unprogrammed requirements have a significant impact on the maintenance mission. The MMC and the support operations office must identify known requirements in advance. Commanders and supervisors seek out information, predict future requirements, and assess requirements for their impact.

MATERIEL MANAGEMENT CENTER

4-25. The MMC mission—

- Is the central data collection and analysis element for all maintenance activities belonging to the command.
- Has responsibility for gathering, maintaining, analyzing, and acting on information in maintenance management information systems.
- Establishes procedures for gathering data and distributing the resulting information to subordinate units and commanders as required.
- Provides technical direction and control of battalion operations for the higher headquarters.
- Provides guidance and day-to-day planning for integrated maintenance and supply management.
- Disseminates information, instructions, and directions through battalion headquarters.
- Controls attachment of augmentation MSTs to tailor support to match the requirements of the supported force. The support group headquarters performs administrative support and exercises command and operational control functions (except for technical direction of maintenance support operations).

4-26. A principal function of the MMC is to advise the command and staff on significant trends and deviations from established standards and to recommend necessary actions.

CAPABILITIES

4-27. The MMC provides most instructions and directives to the maintenance or support battalion relative to disposition of end items or components requiring evacuation. It sets priorities and controls ORFs (peacetime only), provides maintenance and repair parts status, and establishes maintenance repair time guidance. Instructions are broad enough to provide flexibility to battalion headquarters in the organization and deployment of maintenance units and the management and control of their operations.

4-28. The MMC provides—

- Disposition instructions for evacuation of unserviceable items that must be routed to other maintenance units or C&C service companies.
- Information and instructions on the use of MWOs.
- Information on priorities relating to repairs of specific types of equipment or support of specific units.
- Maintenance management information derived through analysis of maintenance data and reports; ensures availability of repair parts required for maintenance or support battalion operations.

The MMC does not directly control workload input of DS maintenance units; however, it can influence the workload and accomplish workload balancing by recommending priorities and changes in repair time guidance.

EVACUATION MANAGEMENT

4-29. Items being evacuated by owning units are normally turned in directly to a maintenance unit or prepared for retrograde as directed by the MMC. If materiel is identified for retrograde, it will be processed by DS units and shipped directly to a port.

4-30. Normally, the MMC will publish evacuation instructions applicable for a specified time period to avoid the necessity for providing individual instructions for the disposition of all items requiring evacuation. MMC may require reports on certain critical or controlled items before issuing disposition instructions. The TAACOM or Corps C&C performs the mission.

SUPPORT OPERATIONS OFFICE

4-31. The support operations office coordinates all maintenance operations in a support group or battalion, provides guidance on maintenance priorities, and sets objectives for production.

4-32. The relationship between the support operations office and shop officers is vital to mission success. The support operations officer coordinates and integrates the battalion's DS-level maintenance mission.

BATTALION-LEVEL MANAGEMENT

4-33. At the battalion level, the support operations officer manages DS-level supported customer units. He supervises, controls, and directs the operation of battalion units for—

- DS-level maintenance.
- Recovery/evacuation.
- Repair parts supply.

- RX.
- Technical assistance.

The support operations office is also a key element in maintenance data collection by ensuring its units provide automated data and generate appropriate maintenance reports on their operations.

4-34. The battalion headquarters commands and controls the displacement, mission assignment, and operations of its units in accordance with higher headquarters plans, policies, and directives. It provides command direction and instructions, supervises, provides assistance, and performs management and control functions to satisfy requirements of supported units IAW higher commanders' intent.

4-35. The battalion headquarters advises support group headquarters on maintenance and repair parts supply matters. These include recommendations concerning—

- Personnel requirements.
- Facilities and equipment requirements.
- Maintenance performance.
- Repair parts supply status.

They also identify other problem areas as required. The headquarters reports the state of materiel readiness, deployment, and employment of battalion units.

COMPANY-LEVEL MANAGEMENT

4-36. Unlike at battalion and higher levels, maintenance management at company level is more focused on each job. The DS-level maintenance mission is resourced and accomplished at company level. It is here that the assets of personnel, time, and repair parts must be managed most effectively to provide the best support possible with the resources available.

4-37. Many techniques used at battalion level also apply at company level, but they require a more personal, direct approach along with an immediate response to actual or anticipated problems. Effective management at company level requires—

- Leadership.
- Production control.
- Workload analysis.
- Determining maintenance requirements.
- Work simplification and work measurement.
- Total quality management (TQM).
- Quality assurance.
- Motivation.

LEADERSHIP

4-38. All supervisors must use effective leadership. Supervisors must know what is to be done and how and when to do it. They must know resources available to do the job, limitations and other factors

influencing job performance, and how to motivate personnel to improve performance and productivity.

PRODUCTION CONTROL

4-39. Production control involves a number of tasks:

- Production planning and scheduling.
- Proper routing and rerouting of work.
- Attaining maximum production by keeping all shop elements working at or near capacity.
- Proper shop layout to achieve time, motion, and movement economies.

Workload Analysis

4-40. Workload analysis is part of the overall production control process. It requires a continuous review of work in process as well as new work, and it is a prime responsibility of the maintenance control section. It helps prevent overcommitment of resources when too much work is accepted with unrealistic priorities and deadlines. Analysis is continuous and is aided by the use of automated SAMS outputs.

Estimating Maintenance Requirements

4-41. In order to forecast maintenance locations and anticipated workload, the control section of each DS maintenance unit maintains a current operations map and equipment density list. The operations maps show personnel the location of adjacent units and supply distribution points, indicate aircraft landing areas, and denote MCP and UMCP locations. MSTs also use them to make strip maps to ensure they arrive at their proper destination. Equipment density lists keep personnel up to date on which and how much equipment is supported and who has it.

Work Simplification and Measurement

4-42. Work simplification and measurement is applied in every unit. Work measurement standards are developed and applied to measure and compare work of repairers and maintenance units engaged in similar types of operations. Units keep records that show production results on a week-by-week basis.

4-43. The most efficient repairers can be compared against the least efficient in terms of quality and quantity of production to obtain a mean or median for measurement of overall performance. Battalion headquarters has information obtained from production reports of other units to permit comparison of production among units or individuals performing the same type of work. Work simplification techniques may, in themselves, uncover ways to improve unit layout to eliminate wasted effort and movement.

TOTAL QUALITY MANAGEMENT

4-44. TQM is a management technique used to supplement quality control procedures by motivating all personnel to produce high-quality work the first time. A functional TQM program becomes evident when soldiers display the motivation and initiative to inspect their own work and take immediate corrective action to resolve quality control problems. TQM should be applied in all units, at all times, in all functions.

QUALITY ASSURANCE

4-45. The objective of quality assurance is to produce high-quality work the first time. An effective quality assurance program is essential to proper, effective performance of the DS-level maintenance mission. It covers all actions necessary to provide adequate confidence that materiel, data, supplies, and services conform to established technical requirements to achieve satisfactory performance.

4-46. Quality control is a subfunction of quality assurance. QC must be applied to all aspects of company operations, including initial, in-process, and final inspections. Technical manuals appropriate to various items of equipment are the basic tools of quality assurance and quality control. Thorough familiarity with DA Pamphlet 738-750, AR 710-2, and AR 750-1 is required. Technical manuals are also important to overall quality assurance.

MOTIVATION

4-47. Supervisors must continually motivate personnel to perform to Army maintenance standards. Commanders and shop officers must develop incentive programs that reward superior performance.

SECTION III - MAINTENANCE MANAGEMENT INFORMATION SYSTEMS

4-48. Section III discusses the maintenance management information systems, SAMS and ULLS-G. Automation greatly increases the ability of maintenance managers to manage the flow of maintenance data. SAMS automates the DS-level maintenance functions while ULLS-G automates unit-level functions. Maintenance management includes forecasting, distributing, scheduling, and controlling the production of maintenance workloads. Factors that impact on maintenance management are budget, supply, personnel, and property accountability.

4-49. At division and nondivision levels, work force utilization data, maintenance performance measures, and cost accounting are managed by SAMS and ULLS-G. When fully developed, SAMS will provide a maintenance management system that ranges from unit to national level. ULLS-G provides unit-level maintenance activities with automated maintenance management procedures. SAMS and ULLS-G procedures are in DA Pamphlets 738-750 and 750-35 and appropriate end user manuals.

STANDARD ARMY MAINTENANCE SYSTEM

4-50. SAMS for DS/GS levels provides maintenance and management information to each level of command from user to division, corps, wholesale, and DA. SAMS is the primary tool maintenance managers use to maintain maintenance information flow between the users, DS and GS levels, and higher-level commands. SAMS is divided into two levels, SAMS-1 and SAMS-2.

SAMS-1

4-51. SAMS-1 operates at the DS/GS maintenance company level. It is an interactive, real-time, maintenance management system that operates on a desktop computer system. SAMS-1 has the capability to produce work order numbers automatically, requisition parts, manage bench and shop stocks, manage shop workload, and provide detailed civilian and military labor costs related to specific work orders.

Functions

4-52. SAMS-1 tracks all work orders and repair parts requisitions and processes status and usage information received from supporting units (ULLS-G). It also passes significant management information to higher commands (SAMS-2).

Interfaces

4-53. SAMS-1 interfaces with the following Standard Army Management Information Systems:

- SAMS-2.

- ULLS-G.
- SARSS.
- Standard Army Maintenance System-Installation/TDA (SAMS-I/TDA).

NOTE

Interface infers data flow in both directions.

Inputs and Customer Benefits

4-54. Table 4-1 shows what information SAMS-1 gets and what it does for the customer.

Table 4-1. SAMS-1 Inputs and Customer Benefits

Inputs	Customer Benefits
<p>SAMS-1 receives the following information:</p> <ul style="list-style-type: none"> • Data from customer units (ULLS-G) • Data from DS/GS maintenance units (SAMS-1) • Data from higher levels (SAMS-2 and SARSS) • Military standard requisitioning and issue procedure (MILSTRIP) • Shop stock list (SSL) and bench stock list (BSL) 	<p>SAMS-1 provides accurate and timely—</p> <ul style="list-style-type: none"> • Requisitioning of parts • Issuing of bench and shop stock • Transferring of repair parts • Accounting of nonstock items ordered but not used • Maintenance of SSL and BSL records • Posting of the document register • Replenishing of shop stock • Controlling of funds for expendable supplies • Issuing and repairing of ORF assets • Accounting for man-hours

SAMS-2

4-55. SAMS-2—

- Operates at command levels above the DS/GS maintenance company, such as the support battalion or maintenance battalion

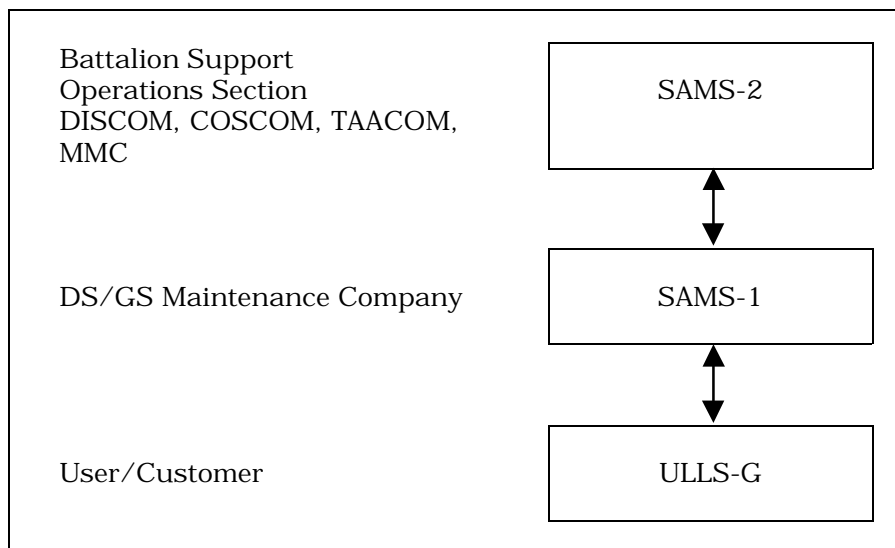
(support operations office) or maintenance battalion (MATO), MMC, division support command, corps support group, corps support command, and EAC.

- Is an interactive, real-time, maintenance management system that operates on a desktop computer system.
- Has the capability to automatically produce management information related to work orders, shop capabilities, backlogs, manpower and parts costs, and inoperative equipment status.
- Provides information through preformatted reports, manager-created reports, and visual displays.

Functions

4-56. SAMS-2 collects, stores, and retrieves maintenance and supply information from SAMS-1 and allows managers to coordinate maintenance workloads. SAMS-2 also passes significant information on to higher commands as well as down to SAMS-1. Table 4-2 shows the progression of SAMS management levels.

Table 4-2. Progression of SAMS Management Levels



COMMUNICATION CAPABILITIES

4-57. As it interfaces, SAMS has three types of automated communication capabilities:

- Monitored asynchronous protocol.
- Communication man-machine interface.
- Blocked asynchronous transmission.

UNIT-LEVEL LOGISTICS SYSTEM³/₄ GROUND

4-58. The Unit-Level Logistics System—Ground collects maintenance and supply data and provides management information at the unit level.

The ULLS-G has replaced portions of TAMMS. ULLS-G interfaces with SAMS and SARSS.

4-59. This section will concentrate on ULLS-Ground in support of general Army maintenance. ULLS-G is an automated system developed to meet the maintenance and repair parts management requirements of company (unit) commanders conducting unit-level maintenance operations.

FUNCTION

4-60. ULLS-G provides unit commanders with—

- Improved accuracy and maintenance reporting.
- Consolidated data needed for unit status reporting by automating the—
 - ♦ Unit maintenance functions in DA Pamphlet 738-750.
 - ♦ Class IX supply functions in DA Pamphlet 710-2-1.

ULLS-G gives commanders and maintenance managers on the battlefield more immediate accurate information for decision making.

HARDWARE

4-61. ULLS-G hardware may differ from unit to unit, but the operating principles of the system inputs and outputs are compatible. Figure 4-3 shows some of the major inputs to ULLS-G.

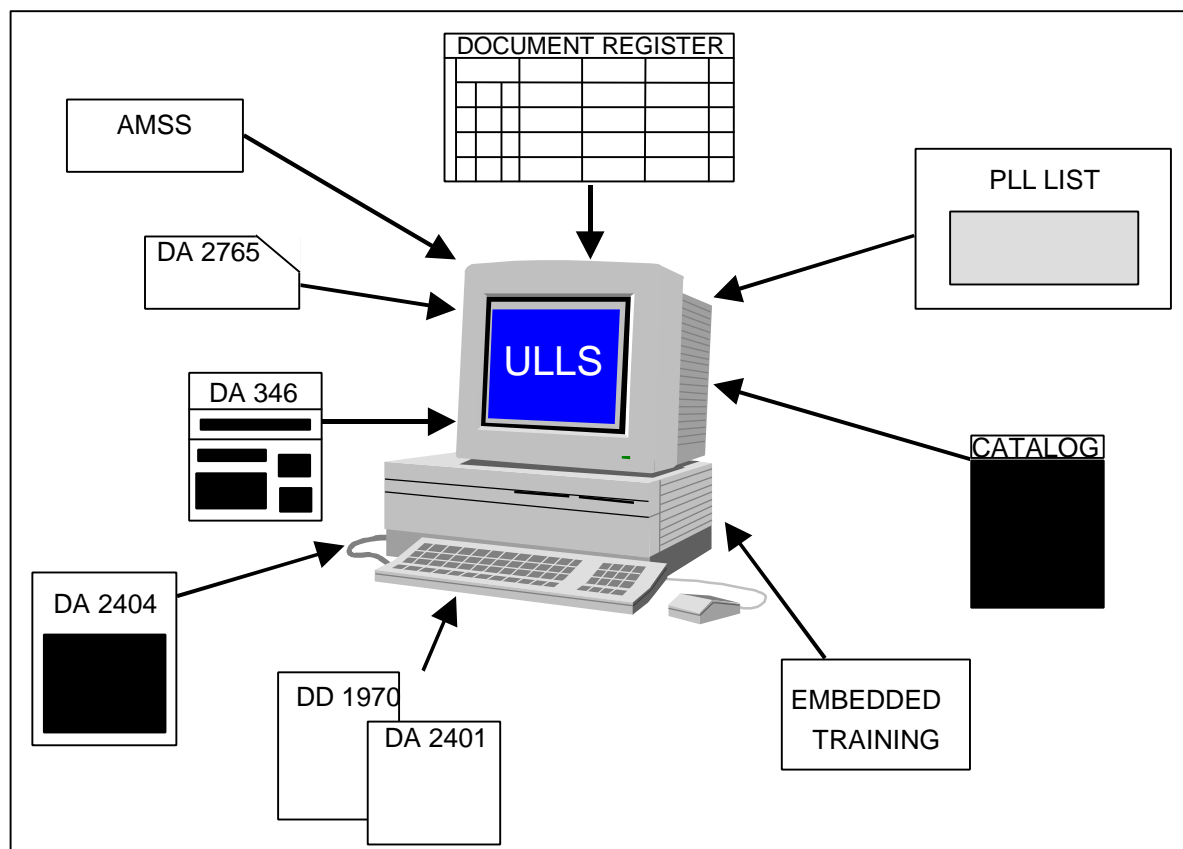


Figure 4-3. Major Inputs to ULLS-G

FUNCTIONAL GROUPS

4-62. The six functional groups available in ULLS-G include—

- Supply.
- Maintenance operations.
- Utilities.
- Embedded training.
- Army Materiel Status System.
- Security.

Table 4-3 shows the function of each group.

Table 4-3. ULLS-G^{3/4} Functional Groups

Group	Function
Supply	Enable operator to process supply transactions and maintain PLL data, including demand records
Maintenance	Enable operator to input and maintain records on equipment, operators, scheduled services, and dispatched equipment
Utilities	Provide backup and restore capabilities for unit data system files and permit establishment of passwords
Embedded training	Provides sustainment training with self-paced tutorials and allows novice users to learn system operation without damage to live files
AMSS	Provides automated materiel condition status reporting
Security	Controls for system users

SUPPLY OPTIONS

4-63. The supply options available in ULLS-G include—

- On-line Class IX catalog.
- Document Control Register (DCR).
- Automated PLL.

Table 4-4 describes the functions of each supply option.

Table 4-4. ULLS-G^{3/4} Supply Options

Option	Description	Function
Class IX catalog	A tailored AMDF of stock items that have current demands	Provides user with current part usage information

Option	Description	Function
Document Control Register (DCR)	Automatically updated list of parts, supplies, and their status	Provides user with— <ul style="list-style-type: none"> • Current status list of parts and supplies • List of parts on hand but not installed
Automated Prescribed Load List (PLL)	List of authorized quantities by unit	Provides user with automatic replenishment of PLL items Recommends additions and deletions to PLL

MAINTENANCE OPTIONS

4-64. ULLS-G interfaces with the Army Maintenance Management System by automating many maintenance operation forms, procedures and records. Figure 4-4 shows ULLS-G maintenance management outputs.

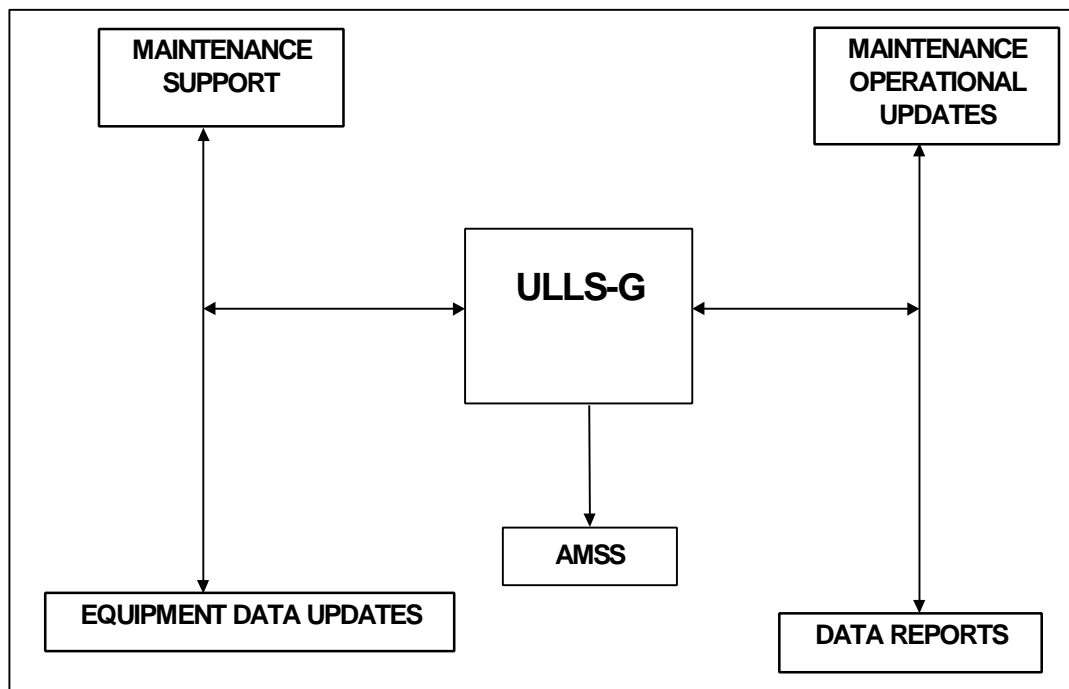


Figure 4-4. ULLS-G Maintenance Management Outputs

ULLS-G GENERATED FORMS

4-65. ULLS-G automates or replaces many complete or partial TAMMS forms with ULLS-G printouts. Some TAMMS forms become unnecessary with the ULLS-G system. Table 4-5 compares some DA/DD forms with their ULLS-G equivalents.

Table 4-5. ULLS-G Equivalent Forms

Form Name	TAMMS	ULLS-G Equivalent
Equipment Utilization Record	DA Form 5823	Not needed in ULLS-G
Motor Equipment Utilization Record	DD Form 1970	DA Form 5987-E
Organizational Control Record for Equipment	DA Form 2401	DA Form 5986-E
Preventive Maintenance Schedule and Record	DD Form 314	DA Form 5986-E
Materiel Condition Status Report	DD Form 2406	Will be automated with completion of AMSS module
Equipment Inspection and Maintenance Worksheet	DA Form 2404	DA Form 5988-E
Maintenance Request Register	DA Form 2405	DA Form 5989-E
Maintenance Request	DA Form 2407	DA Form 5990-E
Uncorrected Fault Record	DA Form 2408-14	DA Form 5988-E
Oil Analysis Request	DD Form 2026	DA Form 5991-E
Equipment Operator's Qualification Record	DA Form 348	DA Form 5983-1-E
Equipment Control Record	DA Form 2408-9	DA Form 5992-E
US Government Motor Vehicle Operators Identification Card	OPT Form 346	DA Form 5984-E

MENU OPTIONS

4-66. The five maintenance options available from the ULLS-G menu are—

- Maintenance operational processes.
- Equipment data updates.
- Equipment data reports.
- Maintenance support.
- AMSS.

MAINTENANCE OPERATIONAL PROCESSES

4-67. Maintenance operational processes and system-generated reports provide the information needed to plan, manage, and control equipment. The operational processes menu contains the options and functions listed in Table 4-6.

Table 4-6. Maintenance Operational Processes

Process	Function
1. Equipment dispatch and return	<ul style="list-style-type: none"> Permits regular or alert equipment dispatching with/without DA Form 2404/5988 Records equipment return from dispatch Lists all equipment dispatches
2. Maintenance and Inspection Worksheet (DA Forms 2404, 5988-E)	<ul style="list-style-type: none"> Provides worksheet for all equipment with a DOD activity address code (DODAAC)
3. Maintenance faults	<ul style="list-style-type: none"> Lists all maintenance faults found during PMCS; records technical inspections and parts ordered
4. Parts received/not installed	<ul style="list-style-type: none"> Lists all parts received for a document number or administrative number
5. Services performed	<ul style="list-style-type: none"> Lists all services performed, or scheduled to be performed, on specified equipment Updates service due files and equipment data files
6. Operator records	<ul style="list-style-type: none"> Maintains record of operator documentation Automatically calculates operator's miles and maintains records of restrictions, awards, and training

EQUIPMENT DATA UPDATES

4-68. This process allows the user to update equipment and administrative number data. The user can update the equipment catalog, change national stock number (NSN) and serial number (SN) data for administrative number data, and update the equipment data files (EDFs). Administrative number changes will update all applicable system files, such as document control registers, dispatch control files, maintenance fault files, equipment service files, and inoperative equipment files.

EQUIPMENT DATA REPORTS

4-69. The equipment data report option allows users to quickly prepare maintenance and usage reports. Table 4-7 lists some of the available reports.

Table 4-7. ULLS-G Equipment Data Reports

Report	Type
Oil analysis request	Routine or special
Equipment availability	Availability and status
Fuel usage	Monthly, quarterly, or yearly
Service schedule report	By administrative, DODAAC or NSN numbers
Non-mission-capable report	Deadline report
Equipment operator/class code	Operator qualifications by class code or by operator ID card
Equipment usage report	Automated DA Form 2408-9
Equipment data file	Data on major end items, components, or system/subsystems by NSN or administrative number

MAINTENANCE SUPPORT FUNCTIONS

4-70. The following ULLS-G functions are necessary to provide an interface with the SAMS. Table 4-8 lists ULLS-G and SAMS interface functions and what they do for the user.

Table 4-8. ULLS-G and SAMS Interface Functions

Function	Action
SAMS transactions	<ul style="list-style-type: none"> Allow user to send maintenance request data directly to SAMS
Maintenance request	<ul style="list-style-type: none"> Produces maintenance request with/without administrative number Produces equipment inspection maintenance worksheet
Manual maintenance status updates	<ul style="list-style-type: none"> Allow user to manually update the maintenance status of equipment on the maintenance request register
Automated maintenance status updates	<ul style="list-style-type: none"> Allow ULLS-G, through SAMS, to automatically update the maintenance status of equipment that is in direct support
Maintenance request register	<ul style="list-style-type: none"> Displays or prints the maintenance request register
Automated maintenance master data	<ul style="list-style-type: none"> Updates the equipment catalog file and allow user to print the master file
AMSS	<ul style="list-style-type: none"> Sends the Materiel Condition Status Report forward to the MMC

UTILITIES OPTIONS

4-71. Utilities options that can be selected from the menu system provide system security features through commander-assigned passwords and user identifications, which permit only authorized users to enter the ULLS-G system.

EMBEDDED TRAINING

4-72 The embedded training package available on the ULLS-G system allows novice operators to receive ULLS-G training directly from the system software. The embedded training package available from the menu system provides the following user benefits:

- A guided tour of the ULLS-G system, including the menu system, available reports, and hardware-software interface with other systems.
- Practice using the system without risk of damage to live files.
- Sustainment training for all users.

AMSS OPTIONS

4-73. AMSS options automate the materiel condition status report (MCSR). The AMSS options allow units to send and receive AMSS records from ULLS-G through SAMS to the Logistics Support Activity (LOGSA). It also allows the unit to generate and submit an automated MCSR for unit status reporting.

SECURITY OPTIONS

4-74. The ULLS-G security options allow the commander to control user access to the system. The options include updating user information, user access, and adding or deleting system users.–

SECTION IV - MAINTENANCE CONTROL

4-75. Section IV discusses maintenance control (shop office) operations and procedures. Maintenance control is a key element of effective maintenance management. It directs and controls work in a maintenance shop in a manner that provides for maximum output of quality work.

4-76. A primary function of maintenance control is to minimize and, when necessary, correct overload conditions in the shop. While a maintenance shop should always work at or near capacity, backlogs must be kept manageable. Overloads are caused by improper routing of work, lack of personnel, or failure to inform higher headquarters of workload problems. TC 43-4 provides details on how to use automation as a tool supporting effective, efficient maintenance operation management.

PROCEDURES

4-77. Maintenance control is a key element of maintenance management. In a maintenance shop, maximum production, effective use of personnel and facilities, and orderly progression of work depend on an efficient, effective maintenance control element. Maintenance units have a maintenance control section, commonly referred to as the "shop office," to accomplish production control functions.

4-78. For operational purposes, the maintenance control section is usually organized according to the functions performed. The result is a maintenance control element, a quality control or inspection element, and a shop supply element. Maintenance control elements perform the following functions:

- Carefully screen maintenance requests.
- Assign work to various shop sections.
- Maintain workload status in the shop section.
- Improve operational procedures.
- Assist in determining parts requirements.

OPERATIONS

4-79. Maintenance control operations involve directing and controlling work flow. Maintenance control requires common sense, effective planning, close supervision, and prompt remedial action. It also requires the managerial tools to direct and control work flow through a maintenance shop in a manner that results in the maximum production of quality work.

COORDINATION

4-80. The maintenance control section must effectively coordinate with the unit's SSA to ensure prompt availability of required repair parts and other maintenance supplies. Table 4-9 outlines the coordination steps.

Table 4-9. Coordination Steps

Step	Action
1	Schedule shop input and assign work to various shop sections to keep all shop elements working at capacity.
2	Carefully screen maintenance requests and inspection reports to ensure maximum unit-level repair. This may also involve evacuation of an item based on the availability of resources, the capability of personnel, and shop capacity.
3	Keep abreast of the status and quantity of work in each shop section to foresee and minimize overload and to take corrective action when necessary.
4	Aggressively pursue repair parts that are not available within the unit.

OVERLOADS

4-81. A prime function of a maintenance control section is to take action to minimize or reduce overload conditions in any of the shop sections. Supported units expect prompt repair and return of items taken to DS level maintenance. Overload conditions in any of the shop sections can seriously delay repair operations to the detriment of the unit's overall maintenance mission.

4-82. Overload conditions can result from—

- Failure to perform unit-level maintenance.
- Required workload temporarily exceeding the available capacity of one or more maintenance shop sections.
- Temporary loss of maintenance capability in the maintenance shop section.
- Failure to evacuate work as directed.
- Competing priorities due to tactical operations.

AVOIDING OVERLOADS

4-83. To avoid overloading—

- Distribute work among the various shop sections to keep all sections working at or near capacity. This is done by carefully routing jobs entering the shop. Routing is the sequence of repair operations that ensures complete repair of each item in the shortest time possible. Any interruption in the normal flow of work needs immediate attention.
- Resolve the problem by rerouting work or supplementing the capacity of the overloaded section with personnel from other sections working below capacity. The battalion may also take action to realign missions, reduce work loads, or provide additional personnel. Refer to Table 4-10.

- Analyze workloads during field operations. This is critical. Available man-hours may be severely reduced by guard duty, defense operations, enemy attacks, weather, unit movement and set up, details, and so forth.
- Work with the chain of command to ensure that necessary details are properly apportioned. Thus an overloaded section provides few personnel for special requirements while another section that is not overburdened picks up the majority of the special duty.

Table 4-10. Rerouting the Work

When...	Consider...
Shifting personnel,	<ul style="list-style-type: none">• Their individual capabilities.• The degree of training necessary to permit them to perform the functions required.
Unit personnel are cross-trained in several specialties,	This as an alternative to shifting personnel.
Movement is impractical due to the partial disassembly of bulky equipment or other factors,	<ul style="list-style-type: none">• Moving repairers from other sections to the job.• Changing the sequence of repair operations.• Moving all items to another shop section.
A vehicle needs engine repairs as well as body and fender work,	Performing the engine repairs first.
The number of engine repair jobs exceeds the capacities of available automotive mechanics,	Completing the body repair work first.

MAINTENANCE CONTROL OFFICER

4-84. For an effective maintenance control operation, the maintenance control officer must—

- Have a thorough knowledge of the mission and functions of the entire company.
- Be thoroughly familiar with capabilities and capacities of the individual sections.
- Keep informed of priorities assigned to supported units, expected workloads, shop progress, difficulties encountered, and maintenance supply status.

MANAGEMENT TOOLS

4-85. Maintenance control requires a continuous flow of data from all maintenance elements in the company and the shop supply element. The control section serves as the center for the production control process. The SAMS-1 reports listed in Table 4-11 are commonly used for automated maintenance management at DS level.

Table 4-11. Commonly Used SAMS-1 Reports

Title	Function
Production / Backlog Status Report (AHN-022)	Shows overall distribution of workload by maintenance shop: <ul style="list-style-type: none"> • Backlog, distribution by section. • Workable backlog. • Work orders evacuated. • Work orders deferred. • Status. • Back order age. (Report can be run daily or weekly.)
Work Order Register Status (AHN-007)	<ul style="list-style-type: none"> • Work orders in WON sequence. • Equipment, customer, man-hours, and work order status data. • Total unit backlog and trends.
Shop Section Summary (AHN-006)	<ul style="list-style-type: none"> • Open work orders and their status. • Work order parts required and supply action. • Only parts on document register. • Current, 30-, 60-, and 90-day status (tailored) <ul style="list-style-type: none"> • This data is used for reviewing-- <ul style="list-style-type: none"> • Shop backlog. • Shop expediency of repairs. • Workload trends efficiency in determining and ordering repair parts.

TUB FILE

4-86. Tub files are constructed by the unit as a backup to the automated systems. Their use is not mandatory and other file systems may be used. Size and design are dictated by unit requirements. Tub files are used to store maintenance work request envelopes (DA Form 3999-4), which contain active maintenance requests (DA Form 5988-E/5990-E) and pertinent records such as parts requests, continuation sheets, and inspection forms.

4-87. Tub files are organized into sections by status. It is recommended for ease of maintenance that common files be located in a single location. This encourages use and accuracy. The DA Form 3999-4s are moved from section to section as a particular job progresses. They are stored in maintenance request number sequence in respective tub file sections.

4-88. Tub files are maintained by four sections in order to control the maintenance backlog: inspection, maintenance control, shop supply, and maintenance shop section. Each maintenance shop section maintains its work orders in status tub files as shown in Figure 4-5.

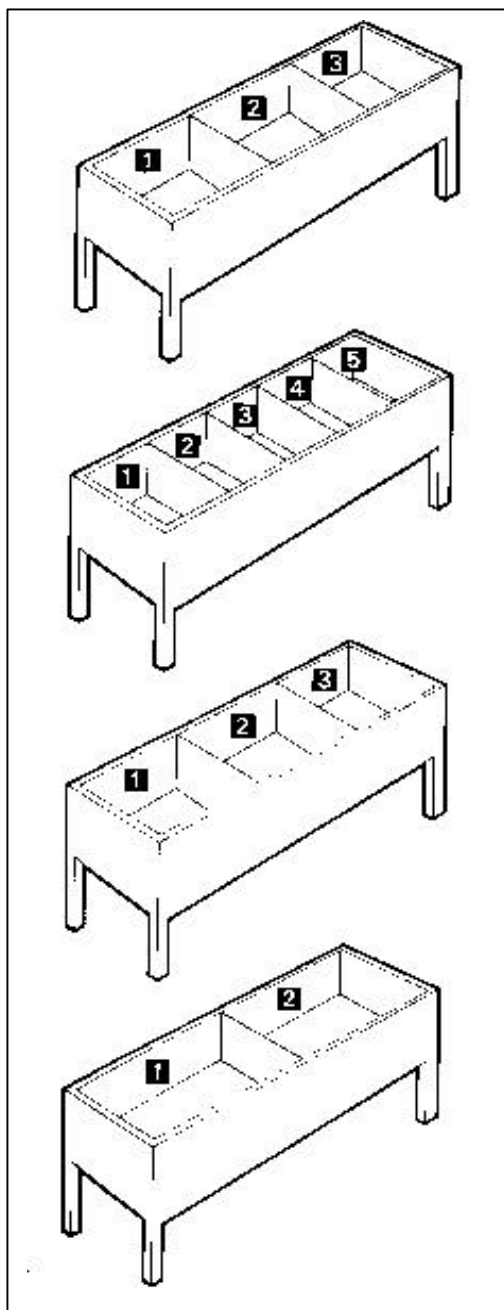


Figure 4-5. Tub Files

PRODUCTION METHODS

4-89. Production methods used in a DS maintenance unit include base shop (bay shop and job/bench shop) and on-site maintenance operations. The method used depends on the type of materiel to be repaired and the personnel, facilities, and time available. The production line is a production method primarily used by GS and higher-level maintenance activities. It may be used to a very limited extent at DS level for repairing large quantities of RX items.

PLANNING AND CONTROL

4-90. The production, planning, and control (PP&C) process is used as a major tool at the local, regional, and national level to plan and control sustainment maintenance requirements and performance. PP&C meetings are held monthly at the local level and quarterly at regional and national levels.

4-91. Local-level initial PP&C meetings review the performance of the current year production program and identify requirements for the upcoming fiscal year. The local manager develops the annual program based on requirements for the geographic area and its capabilities and capacity. The local manager forwards the recommended program to the regional manager, who reviews the requirements and uses this information to select NSNs for concentrated repairs at single installations called centers of excellence (COE).

Center of Excellence Selection

4-92. COE-reparable candidates are generally selected from items that appear on the installation's RX lists. Lines are reviewed in light of readiness and availability needs, cost avoidance, and annual demands. Readiness and availability impacts are determined by reviewing historical weapon system readiness/availability, asset posture, and the item's availability through the wholesale system.

4-93. Selection priority is assigned to each candidate item based on potential cost avoidance per hour. Cost avoidance is evaluated on the difference between the repair or buy cost prior to the establishment of the COE and the repair cost as a COE item repaired at one location. "The top 300 cost drivers" for each installation may be used to identify candidates for repair in a COE, even though they may not already be on an installation RX list.

4-94. COE candidates are reviewed and selected based on the following criteria:

- The item must support a major weapon system or be a significant readiness/availability item.
- Cost to repair (including transportation, packing, and fully burdened labor and materiel) must be less than 80 percent of the buy cost (AMDF price minus table credit). Or the item must be in short supply at the wholesale level and projected demands will exhaust current stockage within six months.

- There must be at least two demands for components per year within the region for aviation reparableables.
- Items on DS RX lists that do not require GS-level repair should not be considered.
- The item must currently be repaired by one installation with at least six repairs per year (ground) and three repairs per year (air).
- The washout rate for the item must be less the 25 percent at the COE.
- Wholesale items must meet established stockage thresholds.

Repair Quotas

4-95. Maintenance activities will be workloaded based on their capacity and capability. When the sustainment maintenance manager (SMM) selects an item for the reparable program, an annual repair quota, by month, will be assigned for the item during the PP&C. The repair quota assigned to a COE item will be initially based on projected demands. These quotas may be reviewed and modified at subsequent PP&Cs. Changes may be required based on specific reasons, such as actual demands, capacity limitations, training cycles, or reported installation excess.

4-96. COE repair quotas will be initially set at 80 percent of the previous year's demands and will be sent to each RSMM for review prior to the quarterly regional PP&C. All changes in production goals will be justified to the RSMM and the other LSMMs. Changes in production schedules for national work will be coordinated with the NSMM. Input for all the LSMMs, the RSMM, and the NSMM is required to establish a COE line.

4-97. Once a COE line is accepted, the installation has a maximum of 90 days to prepare the production line before the quota is executed. The RSMM recommends which maintenance activities in the region will be the COE site for a specific reparable line based on the local bid submitted by the LSMM. The recommendation is based on several criteria, including the bid for man-hours and parts submitted by the LSMMs:

- Repair costs (parts and fully burdened labor).
- Washout rate.
- Capacities and capabilities.
- Training requirements.
- Demands.
- End item density.
- COE for similar item.
- Special repair authority (SRA).

Realignment

4-98. COE lines are realigned as follows:

- COE assignments and performance evaluations are conducted on a quarterly basis during PP&C meetings.

- The evaluation process identifies COE lines that may be advantageous to reassign to another installation or state within the region.
- The RSMM uses the following guidelines to reassign COE lines:
 - ♦ All COE lines with average repair costs exceeding the COE bid by 25 percent or greater after 12 or more months are reviewed to determine reassignment or retainment.
 - ♦ When COE turnaround time (TAT) over the last 6-12 months is excessive (approximately 25 percent greater than the regional average), and another installation/state can repair the items with a shorter TAT at comparable costs, the COE will be reassigned.
 - ♦ When the current COE no longer has the capability to repair the regional program, the RSMM may recommend a new or multiple COEs.
 - ♦ When a new installation/state meets all repair criteria and is clearly advantageous as the COE due to significantly lower costs, predominance of the regional demand, SRA authority, or material time and training required, the COE will be reassigned.
 - ♦ When the current COE's capacity is overwhelmed by new regional players or increased demands from current regional participants, a new COE or a second COE will be assigned.

4-99. National-level work is work that can be accomplished in the region by sustainment maintenance activities to meet wholesale-level requirements. Wholesale item managers identify candidate assets for regional repair and send the RSMM requests for bid and a comprehensive statement of work for review and distribution to LSMMs.

4-100. The LSMMs assess their work center capacity and capability, parts costs, packaging/crating costs, etc., and submit their bid to the RSMM. The RSMM reviews the LSMM's bid and submits the regional proposal to the NSMM, who reviews and submits it to the item manager. The proposal becomes an official document representing a binding agreement with the installation and the wholesale level.

BAY SHOP

4-101. The bay shop production method is used when a variety of jobs are performed in the shop or when the item being repaired is difficult to move. Under a bay shop method of operation, the equipment to be repaired remains in one shop location until work is complete. The soldiers, tools, and equipment needed to do the work move to the equipment/bay shop. Under a modified bay shop operation, personnel or equipment performing the same or similar jobs are grouped together in sections. The equipment to be repaired moves from one section to another at irregular intervals until the work is complete.

4-102. Bay shops are used to repair vehicles, artillery, construction equipment, major missile items, and materials-handling equipment (MHE). Assemblies, components, and on-equipment material may be removed from an end item in a bay and repaired in other shops (for example, a fuel and electric shop). In a field environment, bays are

nothing more than physically separated sections of the maintenance area where work is performed in the open or under maintenance shelters (tents). If adequate covered space is available, buildings may be divided into bays (or stalls).

JOB/BENCH SHOP

4-103. Job/bench shops are used for repair of small items, items requiring a high degree of technical skill, or items requiring repair with equipment mounted in a shop vehicle. Work performed at stands or benches under maintenance shelters or in shop vehicles is considered job shop repair. Items repaired by this method include—

- Components and assemblies.
- Small arms and fire-control instruments.
- Fuel and electrical system components.
- Electric motors.
- Leather and textile items.
- Communications-electronics equipment.
- Missile electronic items requiring repair under controlled conditions.
- Similar items that can be moved without difficulty.

ON-SITE MAINTENANCE

4-104. On-site maintenance is performed by MSTs to the maximum extent possible. There are several advantages to conducting maintenance at the equipment breakdown site, including—

- Reducing equipment downtime, thereby increasing customer unit readiness.
- Eliminating time and resources required for recovery/evacuation.
- Reducing the battlefield signature caused by recovery/evacuation.
- Reducing the potential for increased damage during recovery/evacuation.

4-105. MSTs providing on-site maintenance are organized based on known requirements. They should, therefore, be fully informed before dispatch on the—

- Problem, including type of equipment, malfunction symptoms, and anticipated repair.
- Location, route, and link-up point.
- Requesting unit, point of contact, and frequency and call sign for radio contact.
- Enemy situation and current threat.

PRODUCTION LINE

4-106. The production line method is used to repair or overhaul several similar items when the repair sequence can be divided into a series of independent operations. Production lines provide the most efficient method for repairing a large volume of similar items when the individual operations are not too complicated or time-consuming and the item can be moved easily. The production line is a series of workstations through which similar equipment is passed. Work is performed in sequential order until the final product is repaired.

QUALITY CONTROL INSPECTIONS

4-107. Inspection of materiel is one of the most important aspects of the DS-level maintenance operation. Inspection is essential for an effective, overall quality assurance program. Accurate initial, in-process, and final inspections are vital in maintaining efficient shop operations and ensuring quality repairs.

INITIAL

4-108. Normally, large, bulky, or heavy items such as vehicles, artillery, and materials-handling equipment, are inspected before shop entry to determine equipment faults, extent of work required, economical reparability, parts requirements, and that all on-equipment materiel is present. This initial inspection or preliminary diagnosis is also useful in determining if the using unit has been fulfilling its unit-level maintenance responsibilities. The inspection provides a basis for—

- Recommending evacuation of the item.
- Determining ORF candidates.
- Recommending report-of-survey action (AR 735-5) (in lieu of accepting the item when it appears that equipment damage or unserviceable condition is the result of misconduct or negligence, rather than fair wear and tear or battle damage).
- Determining repair parts requirements.
- Determining man-hours required per the MAC.
- Determining necessary maintenance tasks.
- Estimating required maintenance man-hours.
- Determining if required work is DS-level repair.

For other items, refer to Table 4-12.

Table 4-12. Other Initial Inspection Items

Other items, such as...	Which...	Are...
<ul style="list-style-type: none">• C-E equipment• Small arms• Fire-control instruments• Generators• Motors	<ul style="list-style-type: none">• Do not present bulk or weight problems• Require inspection at a bench or by special diagnostic equipment	Inspected in the shop section responsible for their repair

4-109. Jobs noted in Table 4-12 are normally placed into an “in shop” status during inspection for fault diagnosis. This also applies to items that require disassembly to determine equipment faults. Diagnostic inspections are performed using the appropriate technical manual; equipment fault and parts requirements are recorded on DA Forms 2404 and 2407.

IN-PROCESS

4-110. In-process inspections are necessary to ensure work is being performed properly. Shop supervisory personnel perform these inspections. Inspectors assigned to the maintenance control section may assist them.

FINAL

4-111. After work is completed, inspectors perform a final inspection. This inspection determines the adequacy of repairs and requires a technical inspection of an item, including an operability test to determine serviceability and safety. Final inspections are recorded like initial inspections. If a final inspection reveals uncorrected faults or unsatisfactory repair, the item is returned to the responsible shop element with the cause for rejection indicated on DA Form 2407. Inspectors may make minor repairs or adjustments during the final inspection when they do not warrant formal rejection of the item.

PERSONNEL**Maintenance Unit Area**

4-112. In the maintenance company, inspectors are assigned to the control section for inspection of automotive, engineer, generator, and communications equipment before shop entry. Although assigned to the control section, inspectors are directly responsible to the company commander for the quality of their inspections; however, their immediate supervisor and the maintenance control officer direct their daily work.

4-113. If the commander desires additional inspection capabilities in the control section, qualified maintenance personnel from the maintenance shop sections may be used. These personnel become part of the inspection element; when no longer required as inspectors, they revert to their respective maintenance platoon or section. Inspection personnel work closely with the maintenance control element when performing inspections. Commanders ensure that inspectors are allowed to independently evaluate work and determine whether quality standards are met without shop influence or coercion. If desired, the commander may designate inspection personnel on unit orders.

On-Site Maintenance

4-114. Inspections are also required during the performance of on-site maintenance. On-site inspection is the responsibility of the team chief or supervisor of the team performing the on-site maintenance functions.

WORK FLOW

4-115. The procedures discussed here apply particularly to vehicular end items and similar heavy items that are inspected prior to shop entry. With slight modifications, they can be adapted to most maintenance shop operations. Forms used in the maintenance shop are illustrated and explained in DA Pamphlet 738-750. The following procedures (refer

to Tables 4-13 through 4-23) are in accordance with the automated (SAMS) system.

Table 4-13. Work Flow Procedures Number 1 (Customer Unit Action)

Step	Customer Actions
1	Verifies equipment malfunction.
2	Annotates signature of requestor on DA Form 2407/5990-E.
3	Prepares DA Forms 2404/5988-E and 2407/5990-E and equipment for support maintenance.
4	Performs unit maintenance on equipment.
5	Enters unit data on DA Form 2407/5990-E.
6	Forwards equipment/request and related forms to maintenance unit maintenance control section .

Table 4-14. Work Flow Procedures Number 2 (Maintenance Control Section Action)

Step	Maintenance Control Clerk Actions
1	Receives work request.
2	Edits/screens/verifies work request.
3	Annotates DA Form 2407/5990-E with work order number and tasks.
4	Prepares DA Form 3999-4.
5	Assigns work section to perform repair (if known).
6	Enters DSU data on required DA Form 2407/5990-E into SAMS-1.
7	Enters status "A" on work order. (Status is updated daily from work sections.)
8	Directs customer with DA Form 3999-4 to inspection section.

Table 4-15. Work Flow Procedures Number 3 (Inspection Section Action)

Step	Inspector Actions
1	Receives DA Form 3999-4.
2	Edits/screens/verifies DA Form 2407/5990-E.
3	Performs acceptance/initial inspection.
4	Annotates DA Form 3999-4 maintenance tasks and parts requested on DA Form 2407/5990-E.
5	Prepares intrashop work request (if required).
6	Assigns task sequence number to each required repair task on DA Form 2404/5988-E.
7	Enters signature (inspector who accepts work order) on DA Form 2407/5990-E.
8	Submits status change "C" to maintenance control clerk (if no parts are required).
9	Issues copy of work request to customer.

Step	Inspector Actions
10	Forwards DA Form 3999-4 with forms and records to maintenance control supervisor or shop supply clerk.

Table 4-16. Work Flow Procedures Number 4 (Maintenance Control Section Action)

Step	Maintenance Control Supervisor Actions
1	Receives DA Form 3999-4.
2	Edits/screens/verifies DA Form 2407/5990-E.
3	Annotates DA Form 3999-4.
4	Prepares evacuation request (if required).
5	Determines repair priorities (repair, evacuation, ORF, intrashop, or deferred, etc).
6	Enters tasks from inspection section into SAMS-1 (through the maintenance control clerk).
7	Submits appropriate status (evacuated, ORF, deferred, etc) to maintenance control clerk.
8	Forwards DA Form 3999-4 with forms and records to shop supply clerk and shop repair section.

Table 4-17. Work Flow Procedures Number 5 (Shop Supply Section Action)

Step	Shop Supply Section/Clerk Actions
1	Receives DA Form 3999-4.
2	Edits/screens/verifies DA Form 2407/5990-E.
3	Annotates DA Form 3999-4 and DA Form 2407/5990-E when parts are issued.
4	Prepares repair parts listed on DA Form 2407/5990-E using SAMS-1.
5	Performs supply actions and follow-ups.
6	Submits status change "1" or "K" for awaiting parts and "C" when parts are on hand to maintenance control clerk.
7	Issues repair parts to shop repairer.
8	Forwards DA Form 3999-4 with forms and records to maintenance control supervisor or shop section supervisor.

Table 4-18. Work Flow Procedures Number 6 (Repair Shop Section Action)

Step	Shop Section Supervisor Actions
1	Receives DA Form 3999-4.
2	Annotates DA Form 3999-4.
3	Assigns repairer/mechanic based on repair priority.
5	Submits status change "B" to maintenance control clerk when work is started.
6	Enters man-hours remaining on task work sheet.
7	Forwards task work sheets for daily man-hour accounting to maintenance control clerk.
8	Performs in-process inspections.

Table 4-19. Work Flow Procedures Number 7 (Repair Shop Action)

Step	Repairer/Mechanic Actions
1	Receives job and repair parts.
2	Verifies correct parts on hand for task/job completion.
3	Annotates DA Form 2407/5990-E (work started by) and logbook entries (when required).
4	Performs assigned repair task.
5	Enters signature (repairer) on DA Form 2407/5990-E.
6	Informs supervisor when job is completed.
7	Forwards work completion information on DA Form 2407/5990-E to shop section supervisor.

Table 4-20. Work Flow Procedures Number 8 (Repair Shop Section Action)

Step	Shop Section Supervisor Actions
1	Receives information from repairer.
2	Verifies all tasks on DA Form 2407/5990-E are completed.
3	Annotates DA Form 3999-4.
4	Performs quality control inspection.
5	Directs rework as needed (places items in the holding area).
6	Submits status change "E" to maintenance control clerk when work is finished and "C" if other work is required.
7	Forwards DA Form 3999-4 with forms and records to the inspection sections.

Table 4-21. Work Flow Procedures Number 9 (Inspection Section Action)

Step	Inspection Section Actions
1	Receives DA Form 3999-4.
2	Edits/screens/verifies DA Form 2407/5990-E.
3	Annotates DA Form 3999-4 and DA Form 2407/5990-E (final inspection).
4	Performs final inspection.
5	Directs additional/corrective work if job does not pass final inspection.
6	Assigns additional task sequence numbers (if required).
7	Enters signature (inspector) on DA Form 2407/5990-E.
8	Submits status change "F" to maintenance control clerk for final inspection passed (other status as appropriate).
9	Forwards DA Form 3999-4 with forms and records to maintenance control clerk.

Table 4-22. Work Flow Procedures Number 10 (Maintenance Control Section Action)

Step	Maintenance Control Clerk Actions
1	Receives DA Form 3999-4.
2	Edits/screens/verifies signatures/entries on DA Form 2407/5990-E, including intrashop jobs.
3	Annotates DA Form 3999-4 (initial customer notification).
4	Prepares closeout of all tasks on DA Form 2407/5990-E. Submits status change "S" when work is completed.
5	Performs initial unit contact.
6	Enters contacted unit/time on DA Form 3999-4. Submits status change "R" when customer is notified
7	Issues completed work request to customer. Submits status change "U" to close job when picked up.
8	Forwards completed work request to shop office files.

Table 4-23. Work Flow Procedures Number 11 (Customer Unit Action)

Step	Customer Actions
1	Receives repaired equipment.
2	Annotates receipt of equipment with signature on DA Form 2407/5990-E.
3	Performs acceptance inspection on equipment.
4	Submits unit's copy of work required to maintenance control clerk and receives completed copy for unit files.

INTRASHOP WORK ORDERS

4-116. Intrashop work orders are used when components or assemblies are removed by a shop section for repair by another section in the same unit. Work orders prepared for these transactions provide an audit trail for the parent work order. The inspection section or requesting shop section personnel prepare the intrashop maintenance request (DA Form 2407/5990-E). When the maintenance control clerk enters the intrashop work order into SAMS-1, the parent work order remains in the shop office. If work can be done on the parent and intrashop work orders simultaneously, both work orders are routed to their respective shop sections.

EVACUATION

4-117. Evacuation is the act of moving equipment and documentation from a maintenance activity to another maintenance activity. For example, during a major offensive operation, a direct support maintenance company shop officer realizes that the shop has become overwhelmed with work and a backlog of open jobs is beginning to accumulate. Evacuation of the maintenance requests backlogged may

allow equipment to be repaired and returned to the using unit on a more timely basis.

4-118. The support operations or maintenance control officer's decision to evacuate equipment is based on—

- Initial inspection findings (repairs beyond authority of activity).
- Current or projected workload at the repair activity.
- The time required to repair the item.
- Capability of the unit to complete repair (lack of personnel, equipment, time, etc).

Follow the procedures in Table 4-24.

Table 4-24. Evacuation Procedures

Step	Who...	Will.....
1	SOO or MCO	Coordinate the decision to evacuate a work order with— <ul style="list-style-type: none"> • Maintenance control supervisor. • The supporting maintenance activity.
2	Maintenance control supervisor	Alert appropriate maintenance shop sections to prepare for and evacuate designated work order.
3	Maintenance control clerk	<ul style="list-style-type: none"> • Prepare DA Form 2407/5990-E, annotate DA Form 3999-4, obtain MCO or MCS signature for approval. • Enter status code "O" (awaiting evacuation) and place DA Form 3999-4 in the tub file. • Annotate DA Form 3999-4 (once evacuated) and place request number and support activity in upper left corner. • Retain copy number 1 (receipt) of DA Form 2407/5990-E and enter status code "M" (evacuated for repair and return). • Upon completion of repair, place copy number 3 (organization) into DA Form 3999-4. Annotate and close DA Form 2407/5990-E in accordance with procedures.

MANAGEMENT TOOLS AND TECHNIQUES

4-119. Automation greatly increases the ability of maintenance managers to make decisions regarding maintenance operations. SAMS provides the maintenance manager the tools needed to make timely and accurate decisions.

PRIMARY TOOL

4-120. SAMS is the primary tool used for maintenance management. Daily transfers of data from the maintenance company maintenance control section to battalion support operations section (SAMS-1 to SAMS-2) keep the support operations section's maintenance officer abreast of the maintenance situation in subordinate unit shops.

4-121. In addition to automated SAMS reports, support operations sections may develop local procedures and reports to track maintenance status (such as daily submission of DA Forms 2406, daily production reports, backlog reports, jobs awaiting parts, and so forth).

DAILY ANALYSIS

4-122. The daily analysis of SAMS printouts (or other locally directed reports) will reveal trends or situations requiring command or staff action. Examples of problems to watch for are—

- Jobs greater than 30-60-90 days.
- Significant increases in shop input.
- Excessive number of items awaiting parts.
- Low production.
- Excessive time in any status.
- Class IX requests with no status.

4-123. Such problems might be caused by poor—

- Unit-level maintenance.
- Supply procedures.
- Production/quality control.
- Repair techniques.
- Treatment of equipment.
- Emphasis on-site maintenance.

Corrective actions for these problems might include augmenting subordinate units with additional repair capability, cross training, revising evacuation policies or maintenance time guidelines, increased use of controlled exchange or fabrication.

DAILY TRANSFERS

4-124. On a larger scale, the MMC keeps abreast of the maintenance situation in the corps or TAACOM through its SAMS-2. Daily transfers are received from subordinate company or battalion SAMS sites. This data is used to—

- Evaluate workload capabilities and the capabilities of maintenance units.
- Cross-level maintenance resources and repair parts.
- Establish maintenance priorities.
- Direct evacuation and retrograde.
- Coordinate maintenance issues through the support operations section for resolution.

4-125. Maintenance data is also used by TRADOC and AMC in analyses to determine manpower requirements and TOE structures, repair parts requirements, trends, equipment reliability, and force readiness. These analyses require accurately reported data.

NOTE

Preformatted, hard-copy, numbered outputs are available for management at the SAMS-1 site (company level).

Hard-copy ad hoc reports may also be produced that provide a wide variety of management data. SAMS-1 currently has 12 preformatted ad hoc reports available. Additionally, the ad hoc inquiry process provides maintenance managers with the ability to produce hard-copy reports per the command's data and format requirements.

Procedures and contents are in AISM 18-L21-AHN-BUR-EM and TC 43-4.

SAMS-1 REPORTS AND OUTPUTS

4-126. Table 4-25 is a listing of SAMS-1 outputs readily available for making maintenance management decisions.

Table 4-25. SAMS-1 Outputs

PCN	Title
AHN-001	Workable Jobs
AHN-002	Shop Stock List (SSL)
AHN-003	SSL/Work Order (WO) Issue Candidate Listing
AHN-004	Customer WO Reconciliation
AHN-005	WO Master Schedule Listing Part I - Work Orders in Shop Part II - Work Orders Awaiting Shop Part III - Work Orders Awaiting Parts Part IV - Other
AHN-013	Supply Activities Requirements
AHN-014	Manager Exception Data
AHN-015	SSL Constrained Replenishments
AHN-016	Error Exception Listing
AHN-017	SSL Audit File Purge Listing
AHN-018	Work Order Detail
AHN-019	Supply Status Listing
AHN-020	RPM Update Exception Listing
AHN-021	Equipment Status Listing
AHN-022	Production/Backlog Status
AHN-023	Bench Stock List
AHN-024	Bench Stock Replenishment Review List

PCN	Title
AHN-025	Shop Stock Bin Labels
AHN-026	Bench Stock List (Purged)/Recommended Deletions
AHN-027	Bench Stock Bin Labels
AHN-028	Follow-Up Error Listing
AHN-029	Baseline Versions Report
AHN-030	Turn-In to Supply Support Activity (SSA) (D6Z)
AHN-031	Recoverable Items Report
AHN-032	SSL Manual Inventory Listing
AHN-033	SSL Inventory Report Part I - Inventory Adjustments Part II - Exception Listing Part III - New Labels Required
AHN-034	NSN/UI Change Report
AHN-035	Man-Hour Accounting Utilization Report (Transfer)
AHN-036	Man-Hour Accounting Utilization Report (History)
AHN-037	RPM NSN Change Report
AHN-038	Task Work Sheet

NOTE

Preformatted reports are available for management at the SAMS-2 site (Battalion Support Operations Office and MMC).

Hard-copy ad hoc reports may also be produced that provide a wide variety of management data. SAMS-2 currently has eight preformatted ad hoc reports available. Additionally, the ad hoc inquiry process provides maintenance managers with the ability to produce hard-copy reports per the command's data and format requirements.

Procedures and contents are in AISM 18-L26-AHO-BUR-EM and TC 43-4.

SAMS-2 REPORTS AND OUTPUTS

4-127. Table 4-26 is a listing of SAMS-2 outputs readily available for making maintenance management decisions.

Table 4-26. SAMS-2 Outputs

PCN	Title
AHO-001	Deadlined Equipment Listing Weapon System Part I - Reportable Items Part II - Maintenance Significant Items
AHO-002	Command Deadlined Equipment Summary Part I - Reportable Items Part II - Maintenance Significant Items Part III - Summary
AHO-003	Equipment Deadlined Over NNN Days by Unit Part I - Reportable Items Part II - Maintenance Significant Items Part III - Summary
AHO-004	Completed Work Order Summary
AHO-005	Support Maintenance Turnaround Time (Days) Unit/Activity
AHO-006	Support Maintenance Turnaround Time (Days) ECC
AHO-007	Support Maintenance Meantime to Repair (Man-Hours), Unit/Activity
AHO-008	Support Maintenance Meantime to Repair (Man-Hours), ECC
AHO-009	Selected Work Order Status Listing
AHO-010	Workload Status Listing Part I - ECC Part II - Unit/Activity
AHO-011	Workload Age Summary Listing Part I - ECC Part II - Unit/Activity
AHO-012	Parts Detail Exception Listing
AHO-013	Multiple Parts Request Exception Listing
AHO-014	Production/Backlog Status
AHO-018	Completed Work Order File Purge Listing
AHO-019	Maintenance Cost Command Roll-Up
AHO-020	Maintenance Cost by Commodity
AHO-021	Maintenance Cost by ECC
AHO-022	Maintenance Cost by Customer
AHO-023	Maintenance Cost by APC
AHO-024	Bypassed Receipted Parts Records
AHO-025	Maintenance Production/Backlog Report
AHO-026	Equipment Deadlined over NNN Days by Battalion Part I - Reportable Items Part II - Maintenance Significant Items Part III - Summary

PCN	Title
AHO-027	Reportable Equipment Validation File Listing
AHO-028	Diskette/Comm Interface Parameter File Listing
AHO-029	Maintenance Production/Backlog Report (by Work Order Count)
AHO-030	Maintenance Production/Backlog by ECC (for Support Unit by Item Count)
AHO-031	Maintenance Production/Backlog by ECC (for Support Unit by Work Order Count)
AHO-032	Work Order Status/Parts Listing
AHO-033	Maintenance Production/Backlog by ECC (for Battalion by Item Count)
AHO-034	Maintenance Production/Backlog by ECC (for Battalion by Work Order Count)
AHO-035	Maintenance Production/Backlog by ECC (for Division by Item Count)
AHO-036	Maintenance Production/Backlog by ECC (for Division by Work Order Count)
AHO-037	Inop Transfer Listing
AHO-039	Monthly Float Usage and Accumulative Report (by SPT UIC)
AHO-040	Monthly Float Usage and Accumulative Report (by LIN)
AHO-041	ORF Status and Utilization Report
AHO-042	Serial Number Tracking Report
AHO-043	Serial Number Tracking Report Purge Listing
AHO-044	Manpower Utilization Report
AHO-046	Manpower Utilization Report Purge Listing

INSPECTIONS AND VISITS

4-128. Inspections and visits are also management tools. They indicate materiel readiness, proficiency of personnel, adequacy of operations, and effectiveness of maintenance and supply management. They allow staff personnel to see conditions as they are in the unit, rather than only as represented in reports. If used properly, they are a quick, effective way of noting and correcting problems. The battalion commander, command sergeant major, support operations officer, maintenance company commander, and maintenance control officer should make subordinate unit visits a matter of routine.

OPERATIONAL READINESS FLOAT TRANSACTIONS

4-129. ORF is a quantity of selected end items or major components of equipment authorized for stockage at CONUS installations and overseas support maintenance activities, which extends their capability to respond to materiel readiness requirements of supported activities. It is accomplished by providing supported activities with serviceable replacements from ORF assets when their like items of equipment cannot be repaired or modified in time to meet operational requirements. The support operations officer or shop officer is responsible for reviewing equipment requirements of supported units IAW ARs 710-2 and 750-1 and when appropriate in directing ORF transactions.

PROCESS

4-130. When an ORF transaction becomes necessary, the following process should be followed:

- Maintenance control supervisor reviews all transactions and their documentation before submission to the support operations or maintenance control officer for final approval.
- Support operations officer or maintenance control officer directs/approves the ORF transaction.
- Maintenance control clerk prepares all documentation for the ORF transaction.

PROCEDURES

4-131. When an ORF transaction becomes necessary, follow the procedures in Table 4-27.

Table 4-27. ORF Procedures

Step	Who...	Will.....
1	Maintenance control supervisor	Monitor and supervise the maintenance control clerk in conducting the ORF transaction.
2	Maintenance control clerk	<ul style="list-style-type: none"> • Generate a new work order on SAMS-1 for issuing a serviceable float item. • Annotate awaiting float transaction status code "7" (initially) on the new work request on completion of the ORF transaction. • Annotate a "U" (picked up). • Report to the maintenance supervisor when the actual issue and turn-in of property are completed IAW policy and procedures identified in ARs 710-2 and 750-1 and DA Pamphlet 710-2-2. Correct accountability is maintained at the ORF SRA and in the property book.

NOTE

Unit must update property book, AOAP, ULLS-G, etc when a float transaction takes place.

STATUS CHANGES

4-132. Status changes annotated on a maintenance request document are the result of the physical tracking of a job and its documentation. Routinely updated status allows managers to have current visibility of a specific job. Thus, effective emphasis can be applied to expedite supply and repair actions.

4-133. Table 4-28 outlines procedures for changing the status on a work request.

Table 4-28. Status Changes on Work Requests

Step	Who...	Will.....
1	Shop section chiefs	<ul style="list-style-type: none">• Submit daily man-hour accounting to the maintenance control clerk on each work order (by shop section that performs hands-on work) using the Task Worksheet, PCN AHN-038.• Submit changes in status by other means (i.e., DA Form 3999-3-R) for sections that do not track man-hours.• Report status changes for all maintenance requests in the section to the maintenance control clerk daily.
2	Maintenance control clerk	<ul style="list-style-type: none">• Enter all status changes submitted from shop sections into SAMS-1 at the end of the work day.• Ensure data transfer to SAMS-2 is correct, complete, and timely.• Identify and verify each open maintenance request in the shop against the piece of equipment in for repair.• Monitor and manage the progress of each job in the section.• Provide daily customer disk status report.
3	Maintenance Control Supervisor	<ul style="list-style-type: none">• Monitor and review the status of all maintenance requests and ensure the most current status is annotated on all documents.• Directly supervise the maintenance control clerk to ensure end-of-day status changes are properly annotated into SAMS-1.

SHOP SUPPLY OPERATIONS

4-134. Shop supply is a critical aspect of shop operations. This element provides repair parts and consumable items to support DS-level

maintenance operations. A unit with an effective shop supply operation provides effective support to its customers.

4-135. The shop supply element is usually collocated with the maintenance control element; it normally consists of one to two equipment automated logistics specialists who—

- Prepare repair parts requests based on information from repairers or inspectors.
- Maintain an automated or manual document register.
- Process monthly recon with SSA.
- Record information on repair parts supply transactions.
- Receive, store, and issue parts for specific job orders.
- May obtain, store, and issue demand-supported repair parts (shop stock) and obtain and issue high-demand, low-cost consumables (bench stock).
- Monitor turn-in of recoverable items.

ORDERING REPAIR PARTS

4-136. Shop supply clerks use DA Form 2407/5990-E or 2407-1 to request parts with SAMS-1. DA Form 2407/5990-E or 2407-1 must list all parts based on data provided by the inspector. Clerks need the following information for ordering parts electronically:

- Action code.
- Related task number.
- NSN or part number.
- Quantity required.
- Not-mission-capable supply (NMCS) status.

TYPES OF SHOP SUPPLY

4-137. DS maintenance units maintain two types of shop supply:

- Bench stock.
- Shop stock.

AR 710-2 and DA Pamphlet 710-2-2 contain additional details on bench stock and shop stock.

Bench Stock

4-138. Bench stock consists of low-cost, high-usage, consumable items used by maintenance personnel at an unpredictable rate. It must meet criteria set forth in AR 710-2. Bench stock includes—

- | | |
|--------------------|-------------------------------|
| • Common hardware. | • Capacitors. |
| • Transistors. | • Wire. |
| • Resistors. | • Tubing. |
| • Webbing. | • Hose. |
| • Thread. | • Rope. |
| • Welding rods. | • Other expendable materials. |
| • Sandpaper. | |

4-139. The maintenance control officer—

- Selects stockage based on mission needs. The only required records for maintenance of bench stock are bench stock record lists (approved semiannually by the commander) and bench stock replenishment tags. (For information of these records, see DA Pamphlet 710-2-2.)
- Closely monitors bench stocks to maintain unit mobility and supply economy. Frequent stockage review and prompt requisition for bench stock items ensures adequate levels of supply.

Maintenance activities may stock up to a 15-30-day supply of bench stock.

Shop Stock

4-140. Shop stocks are demand-supported repair parts and consumables used by a DS-level maintenance activity. Shop stocks support internal DS-level maintenance requirements, both programmed and unprogrammed. Shop stocks are authorized—

- To repair items in support of the reparable exchange program.
- For elements of maintenance units operating at a remote location, such as maintenance support teams.
- To repair items requiring diagnostic modules.
- For maintenance units not supported by an organic supply support activity operating under the direct support system (DSS).

DSS customers are those units that requisition directly from the wholesale supply system through the intermediate level with no backup assigned stockage list at the DS level.

4-141. To qualify for shop stock, an item must have at least three demands in a 180-day control period. Stockage level for shop stock is developed from the requisitioning objective table contained in DA Pamphlet 710-2-2. Replenishment is based on a reorder point. Automated systems may use the use-one, order-one concept. Each shop stock list is reviewed at least quarterly. Items are deleted from stockage—

- When they fail to receive at least one demand in a 180-day control period.
- Unless they support seasonal requirements and demand is anticipated.
- Unless they support requirements peculiar to nonstandard equipment.

FIELD SITE SELECTION AND LAYOUT

4-142. In a maintenance operation, the objective of a good layout is to facilitate the flow of work through the shop and to minimize movement of repair parts, tools, equipment, and personnel. Some compromise must be made because of the need to defend the area. Field environments seldom permit a unit to operate under ideal conditions.

The layout must be tailored to the terrain, tactical situation, proximity of supported units, and type and amount of equipment supported.

SITE SELECTION

4-143. When selecting a field site for maintenance support operations, consider the following criteria. The area should—

- Be reasonably flat with good drainage.
- Be firm enough to permit parking and movement of heavy vehicles and equipment.
- Be accessible to supported units.

Any terrain features in the area that facilitate unit defense must be considered in planning. Streams or marshes can provide flanking security. Hills can provide observation and facilitate fire on avenues of approach. Built-up areas inherently enhance defense and mission support capabilities.

LAYOUT

4-144. Following are principles for laying out the company area:

- Locate—
 - ♦ Work sections within ready access to the external road network and to each other.
 - ♦ Supply storage areas close to a road to permit easy access for trucks.
 - ♦ The service section within easy access of all maintenance shops.
 - ♦ Recovery elements in the vicinity of the base maintenance platoon to facilitate support and movement of vehicles.
 - ♦ The maintenance control section, inspection section, shop supply, and SSA near the entrance to the company area.
- Ensure—
 - ♦ Maintenance areas provide vehicle dispersion and positions where control and security are possible.
 - ♦ The area is capable of being defended, using the terrain's natural defense characteristics to augment the defense plan and unit capabilities.

Company area should be reasonably flat, provide good drainage, and contain firm soil for movement of heavy vehicles. Use terrain features to enhance unit defense.

AREA REQUIREMENTS

4-145. Area requirements depend on the style and tempo of combat, which influence workload, security requirements, the ASL volume carried, the commander's willingness to risk, evacuation policy, and size of the workload backlog permitted. Consider the following situations:

- In a desert environment, an enemy that possesses great indirect fire capability or that attains air parity may require the unit to maintain greater dispersion.

- MOUT operations or an enemy in close terrain, one that relies on infiltrating unit perimeters, or one that possesses few indirect-fire weapons may mandate a smaller company area than prescribed by Army doctrine. Figure 4-6 shows a sample maintenance company layout.

NOTE

Under most conditions, the planning area provides enough dispersion to operate without serious degradation of unit efficiency and without significant vulnerability to insurgent attacks

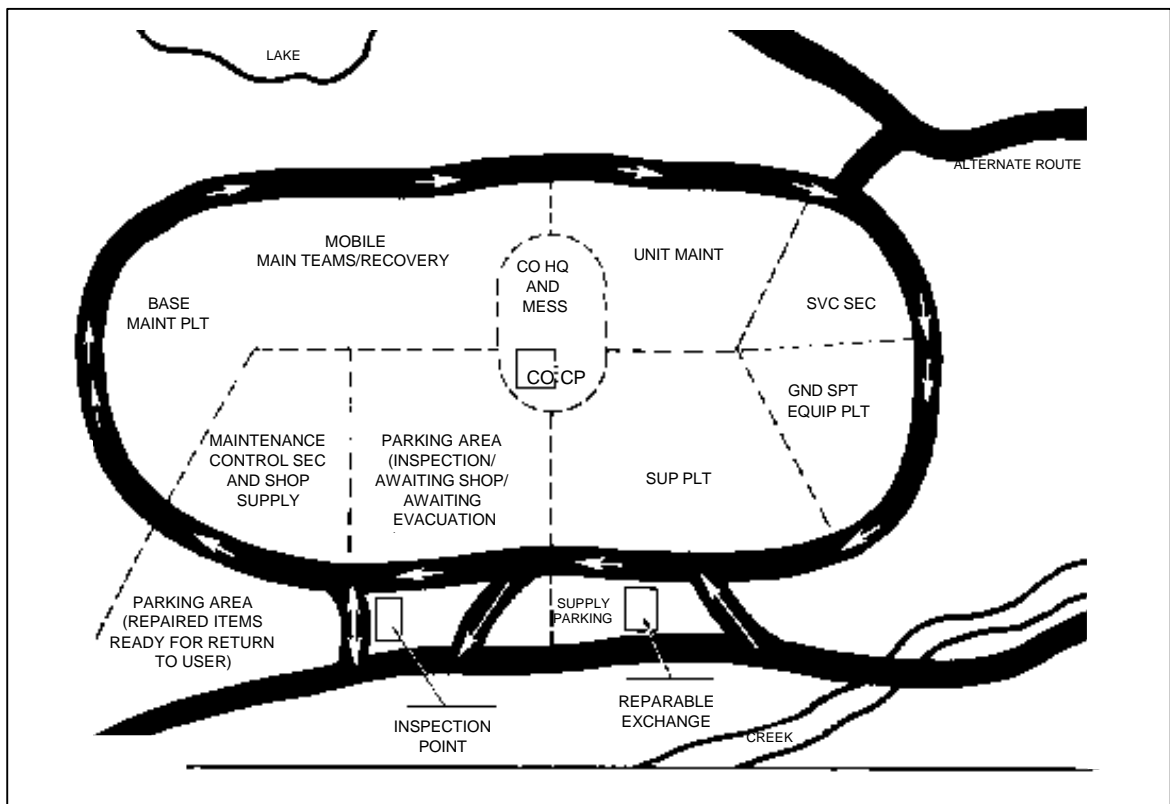


Figure 4-6. Sample Maintenance Company Layout

SECTION V - UNIT INTERNAL MANAGEMENT

4-146. Section V discusses factors affecting mission performance and items of particular interest to DS maintenance units. Unit internal management includes various operations:

- Unit administration.
- Personnel management.
- Inspections.
- Unit dining facility operation.
- Movement and defensive operations.
- Unit security, including physical security and OPSEC.
- Safety.
- Training.
- Communications.
- Rear operations.
- Unit maintenance and supply operations.

4-147. Many of these operations become routine, either by their nature or the commander's decision. SOPs can be prepared for these operations, which relieves the commander of repeated planning and issuing of directives for operations that follow an established pattern. The commander can then concentrate on operations that require planning and directing as requirements develop.

MISSION PERFORMANCE

4-148. Many factors directly affect the unit's completing its maintenance and repair parts supply support mission. Particularly significant are—

- Efficient, effective administration and management of all aspects of unit operations.
- Adequate preparation and implementation of plans for tactical operations.

SECURITY AND MOVEMENT

4-149. Modern tactics of warfare, both offensive and defensive, stress—

- Dispersion of facilities.
- Rapid deployment.
- Selection and use of terrain to facilitate passive defense as well as mission performance.
- Physical and communications security.
- Detailed planning and training in conducting operations.
- Proper intervals and security during movement, which thwarts threat initiatives.

Combat forces may bypass pockets of enemy resistance. Unless proper defensive measures are taken, this will make units in rear areas vulnerable to enemy ground action.

4-150. Low-intensity operations pose the same type problems. Maintenance units will have to operate from, and help defend, logistical complexes that may be subjected to guerrilla or insurgent attack from any direction, at any time, with insecure ground lines of communication.

This requires a continuous defensive posture, even for routine functions like unit resupply.

4-151. DS-level maintenance and other types of support organizations are the backbone of rear operations; they are required to plan and execute related operations and provide personnel and equipment for area damage control teams. DS maintenance units must be able to wage an active defense when necessary and execute tactical-type movements.

ADMINISTRATIVE OPERATIONS

4-152. Security and movement will complicate organizational dining facility, supply, and unit-level maintenance functions. Also, communications with parent units and resupply of all classes of materiel may be interrupted. The possibility of isolated operations for limited periods must be considered. Commanders must make maximum use of their four basic resources—manpower, materiel, time, and facilities—to accomplish the mission regardless of circumstances. Continual attention to personnel management problems is necessary.

4-153. Other areas allied to unit administration that must be given careful attention include—

- Standing operating procedures.
- Administrative records and reports.
- Personnel morale and welfare.
- Organizational maintenance operation.
- Environmental laws and regulations.

4-154. One of the more important duties of the company commander is to inspect the unit's internal operating functions at frequent intervals. Inspections should include—

- Unit dining facility.
- Unit supply and maintenance operations.
- Individual clothing and equipment.
- Safety of unit operations.
- Adherence to unit and higher-level SOPs, directives, and plans.

DIRECT SUPPORT MAINTENANCE UNITS

4-155. Detailed aspects of unit internal management are not described in this manual. Nevertheless, some aspects of these operations are emphasized below, particularly their importance to, or impact on, maintenance unit operations.

COMMUNICATIONS

4-156. The distance between a battalion headquarters and its companies normally exceeds the maintenance unit's wire-laying capabilities. It may also exceed the range of its radios. Therefore, the corps area (or equivalent) communications system is usually the only practical long-range communications system available to interconnect the dispersed elements of a battalion-size CSS unit. The corps area

communications system also provides communications between a maintenance unit and the units it supports.

4-157. Where practical, each maintenance or support battalion headquarters and independently operating maintenance company should have access to a signal-installed-and-operated node. Commanders must plan early with the supporting signal unit to ensure that specific requirements for signal support are available. The two primary means of communication for maintenance units are telephone and radio.

SELECTING A MAINTENANCE AREA

4-158. The selected site should have the best roads in the general area. Ideally, the unit should locate along a main supply route or at the junction of several routes. Individual maintenance units should locate in a centralized area as near as possible to the units they support to be accessible to all supported units. Roads should be well drained. A good internal road network is also required.

4-159. Use hardstands and facilities, if available. Terrain must be generally level; otherwise, the ground must be stabilized to withstand heavy traffic. Large areas are required for parking vehicles. Work areas should be located so that the prevailing wind blows dust away from roads and parking areas.

4-160. Unit defense is another consideration when selecting a site. The area selected should employ natural terrain and obstacles to defend the unit's perimeter. To the extent possible, vegetation should provide cover and concealment of unit operations. Avoid locating the unit in low areas where flooding could disrupt operations. The battalion headquarters and headquarters company usually locates with one of the battalion units.

DEPLOYMENT

4-161. Maintenance units move when the distance to supported units becomes too great to permit efficient service. They may also be required to move because of an increased workload in another area or for defense. The limited mobility of a maintenance unit has a bearing on movement. Organic transportation is insufficient to move the entire company and its ASL at one time (a unit must move all organic equipment and its current workload). Normally, the unit will move itself by shuttle since additional transportation assets will rarely be available. Shuttling involves transporting troops, equipment, and supplies by a series of round trips using the same vehicles.

4-162. Moves should be made in one trip if at all possible. This allows for rapid reestablishment in a new location and speedy resumption of maintenance support. To move the unit in one trip, the maintenance unit must request additional transportation through battalion headquarters. Battalion headquarters, in turn, places the requirement on the nearest transportation movements office.

4-163. Transportation requests should include the date of the move, routes, destination, time and place vehicles are needed, number of

personnel to be moved, and the quantity, types, tonnage, and cubes of materiel to be moved. If additional transportation is not available, the unit will need to use the shuttle system.

DEFENSE

4-164. Maintenance unit commanders must consider possible attacks by aircraft, missiles, airborne troops, guerrillas, insurgents, or elements of organized ground forces. Because of the supplies and equipment they carry and their limited defense capability, maintenance units are an attractive target for guerrillas seeking supplies or trying to destroy equipment.

4-165. Pilferage is also a problem because guerrilla forces obtain some of their supplies through the black market. By nature, maintenance requires a continuous effort and specialized personnel not present in combat units. The continuous use of large numbers of maintenance specialties for security duty can completely eliminate the unit's capability in certain specialized areas.

MINIMIZING EFFECTS ON SECURITY

4-166. The maintenance commander can minimize the effects of security requirements by—

- Selecting a good defensive position. The better the position from a security standpoint, the fewer personnel will be needed for security operations. The position can be improved by coordinating with engineer units.
- Collocating with other support units. Locating the maintenance unit next to another unit in a single base reduces security requirements. If the possibility of air attack makes such concentration undesirable, the separate perimeters of the units can be placed close enough to give mutual support. This is referred to as a base cluster defense operation.
- Coordinating guard selection with technical supervisors. Maintenance specialists should not be arbitrarily assigned to guard duty from an alphabetical roster or selected from unit work sections based on a percentage figure. Supervisors should not select personnel whose absence has a significant effect on the maintenance mission.
- Requesting augmentation by security forces where security requirements seriously reduce the maintenance unit's mission capability for an extended period.

4-167. In most cases, ground attacks are made by guerrillas or insurgents. The attackers generally do not have air, armor, or artillery support. Usually, they also lack sufficient ammunition for sustained action. They depend on the shock of unexpected, intense infantry attacks using automatic weapons, mortars, rocket launchers, and demolition charges. Such an attack can penetrate the maintenance company and cause serious personnel and equipment losses. The

attackers are likely to take advantage of darkness and weather conditions that ground friendly aircraft.

4-168. Planning the layout of the company should include consideration of both defensive characteristics and maintenance mission requirements. Plans to meet any type of attack that the enemy is capable of are prepared and made part of the unit SOP. These plans are revised as often as necessary. They are rehearsed regularly to assure that all personnel know their duties and responsibilities if attacked. In addition to conventional ground attack, defense plans must consider aircraft attacks and enemy use of NBC agents.

4-169. The maintenance company commander must keep abreast of the tactical situation and the enemy's capabilities. The commander should be warned of probable enemy attacks. Most intelligence information is provided through the battalion S2/3. Military police can also provide information, particularly on security of the routes the company uses to conduct daily business with supported units. Additional information may be provided by supported units but must be verified. Security and defense plans are developed according to the mission, area of operations, tactical situation, intelligence, terrain, weather, and unit capabilities.

COUNTERING THE ENEMY THREAT

4-170. Commanders must consider all possibilities for upgrading a unit's defense to counter the enemy threat:

- Direction and adequacy of fields of fire.
- Avoidance of congested sleeping areas.
- Placement of anti-armor and indirect-fire munitions.
- Manning, equipping, placing, and communicating with listening/observation posts.
- Unit dispersion in accordance with the threat.
- Location of a HET evacuation point in or near the unit area.
- NBC defense measures and decontamination plans.
- Placement and use of early warning devices.

4-171. Additional considerations are—

- Selection of—
 - ♦ Unit perimeter and use of available terrain to minimize unit defense weaknesses.
 - ♦ Unit positions for organic weapons with particular emphasis on crew-served and indirect-fire weapons.
 - ♦ Fighting positions and protective bunkers that accommodate all unit personnel.
- Improvement of—
 - ♦ Terrain and road network, using organic assets or coordination with supporting engineers.
 - ♦ Cover and concealment for vehicles, equipment, and fighting positions.
- Coordination of—

- ♦ Field artillery targets.
- ♦ Engineer-emplaced and unit-emplaced protective minefields and obstacles on likely enemy ground avenues of approach.
- ♦ Air defense and use of unit small arms for air defense (SAFADS) along likely air avenues of approach.
- ♦ Level 1 reaction forces within the base and base cluster.
- ♦ Support for Level 2 and Level 3 reaction forces.
- Use of—
 - ♦ Internal and external patrols for active defense measures.
 - ♦ Customer equipment that is awaiting pickup to enhance unit defense.
 - ♦ Current intelligence to determine defense manning levels and readiness posture.
 - ♦ Internal communications.
 - ♦ Radio silence.
 - ♦ Prearranged signals for specific actions such as final protective fires.
 - ♦ Deception measures.

